

# The Mining And Metallurgical Journal

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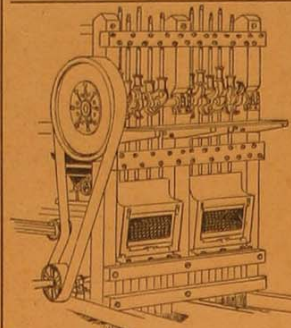
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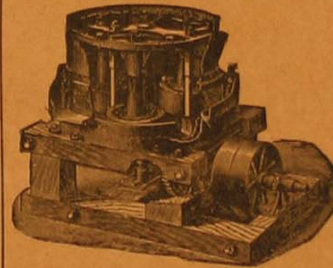
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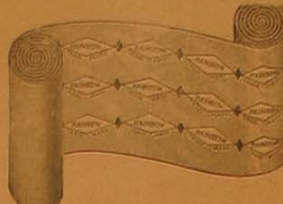


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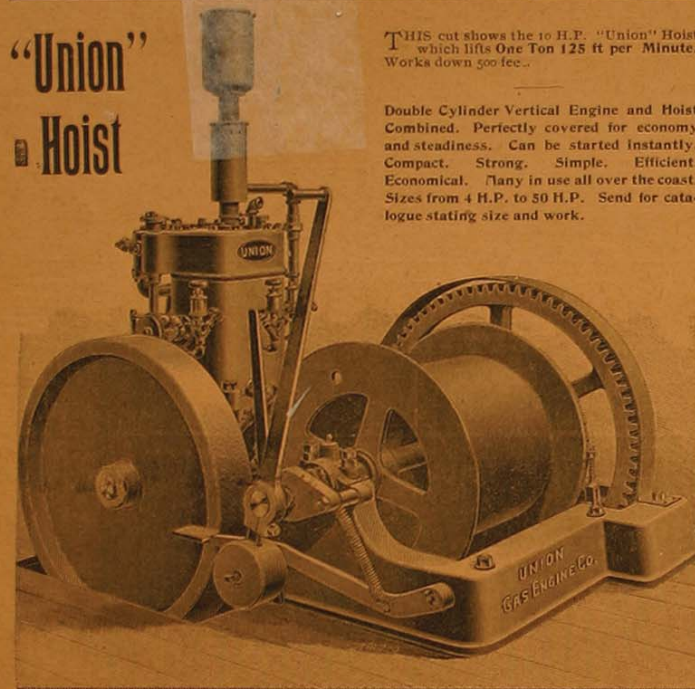
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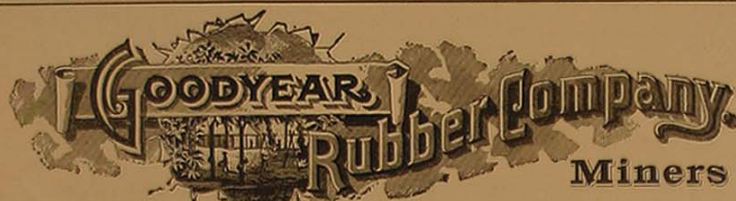
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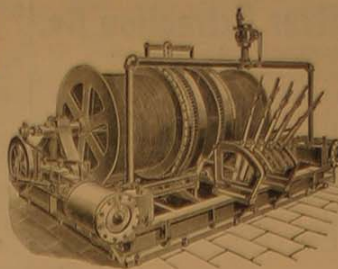


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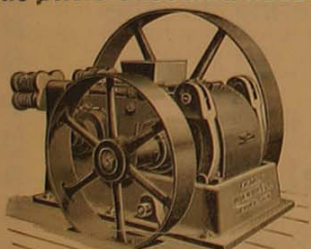
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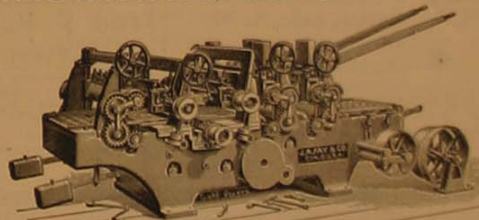
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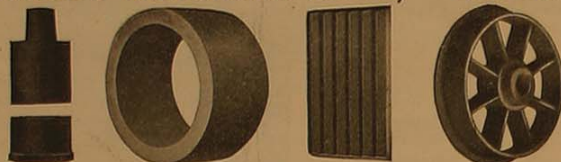
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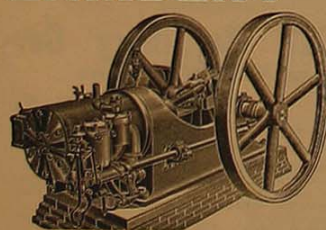
See

Incorporated Mines Paying Dividends

Page 22

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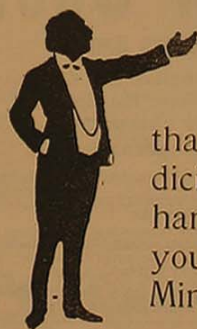


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ISSUED SEMI-MONTHLY

ADVERTISING RATES FURNISHED ON APPLICATION

## A DAY'S LABOR.

where even the eight-hour day could not be worked on account of excessive heat or an extraordinary amount of mine water, but these remarks apply only to the maximum amount of labor which ought to be expected from the miner under the most favorable circumstances. At any mines where eight hours is not the present day's labor, this is a good time to make the change when the industry is in a prosperous condition. This is a measure by which the employer can elevate the standard or condition of those employed by him without any direct loss, for its tendency is to improve the health and social condition of those employed.

## THE GREAT EXPOSITION.

Through the labors and perseverance of the United States Commissioner, General Hon. Ferdinand W. Peck, the United States have been allotted space at the Paris Exposition, to be held in 1900, nearly double that originally secured, and comprising a larger allotment than any other foreign nation is granted. On this account, a larger appropriation than was first contemplated becomes indispensable to enable the United States to still remain at the head of the list of nations, where she now stands. The total number of square feet secured by the Commissioner General is over 220,000, and the actual appropriation already available is only \$650,000, which was obtained when the first allotment of space was made.

A few comparisons with other nations, in regard to the space given them and the appropriations made by their governments, will do much to show how badly Mr. Peck needs more money to present our true status as a nation in every department of our vast national activities. Germany has about 150,000 square feet of space, and has already appropriated \$1,250,000; Austria has secured 110,000 square feet of space and appropriated \$550,000; Hungary, 100,000 square feet, appropriates \$630,000; Italy 120,000 square feet and appropriated \$600,000; Japan 50,000, with an appropriation of \$625,000.

The great United States of America has secured 220,000 square feet, to provide for which Mr. Peck is now limited to \$650,000, or, in other words, other great nations have provided a sum for their exhibits averaging nearly three times as much per square foot as has the United States, and most of these countries are upon the borders of France, while we have an ocean expanse of 3,000 miles to cross, and a great continent, lying between the Atlantic and Pacific, from which to collect and select exhibits, involving a larger corps of assistants and heavy traveling expenses.

The Commissioner General has appointed J. F. V. Skiff, the noted Colorado mining man, to represent him in the division of mines and metallurgy. Mr. Skiff was the chief executive for this division at the Columbian Exposition at Chicago in 1893, and proved himself to be an able man.

The importance of an adequate mineral exhibit from Southern California cannot be overrated, and there should be more enthusiasm instilled in our miners and mine owners.

The special representative to the Pacific Coast, Olaf Ellison, is a man of ability, is also an old pioneer in Southern California, and knows the country and its resources well. He is in Los Angeles, Cal., at the present time, compiling information for the Commissioner General, and should receive the hearty co-operation of the mining men of the state.

Every courtesy possible should be shown him, and his labors in our midst should be lightened as much as possible.

The Los Angeles Chamber of Commerce has taken an active part and passed strong resolutions, soliciting our representatives in Congress to co-operate with Commissioner Peck in any effort on his part calculated to advance the most complete exhibit of the United States' resources, arts and industries at the Paris Exposition of 1900.

### ACCIDENTS WHILE HOISTING.

In these days of rapid hoisting from deep shafts, it is necessary that all the precautions possible be taken to avoid accidents, and by using the best class of machinery for that purpose. Recent accidents and the death of miners are the cause of this remark. Where rapid hoisting is done, the gallows or head gear at the shaft should be a high structure, so as to avoid accidents from over-winding. Recently constructed plants of this description, which are 100 to 125 feet in height, are planned with that end in view, as well as to give elevation for milling the ore. In the event of an accident to the bell rope, or where the wrong signal is given, from that or other cause, the engineer has time to correct the mistake, where the shaft house admits of his seeing the error in time to slow or stop, when miners are the load and not ore. This is a class of accident that applies to vertical as well as to incline shafts where a skip is used, hence the necessity to have high frame work, for a clear view of the load hoisted. By planning the plant, so as to give the engineer every chance to avoid an accident, lessens the responsibility of the employer. The qualification of being a good mechanical engineer or machinist is no surety that he is also a capable person to run a hoist. In fact the best runners of the hoisting plants are no mechanics, for this class of work requires special personal qualifications, which are intuitive in the individual and cannot be acquired, although practice and application will cause improvement in some cases. He must be quick of action, yet cautious, courageous, but have a keen sense of danger, not easily confused and of an even temper; these are some of the qualifications which cannot be imparted to him by instruction from others, or gained by his own experience in operating a hoist, although practice will develop them to some degree. Next to the foreman in a mine, the hoist attendants are the next important to make a careful selection, to obtain the right men, and those in whom the miners have confidence. As mentioned in a former article on the necessity for an inspector of mines for California, the too frequent occurring accidents while hoisting, are another reason why such an official should be added to the staff of the State Mining Bureau. It is not to be expected that such an official would put a stop to all accidents in hoisting, but his investigation of the facts attending each case, and report and remarks on the same, would aid in framing rules whereby similar accidents may be avoided in future.

### SUFFICIENCY OF CAPITAL.

That is what is necessary to the highest prosperity of the country. Do Americans possess it to the extent demanded in all the practicable and profitable productive enterprises which our resources and facilities suggest?

It seems that our capitalists are seeking in-



vestments in Cuba and Porto Rico and are making an investigation of opportunities in the Philippines, if they finally come to us and a government is established and maintained which assures protection to life and property. Because this is being done it is argued that we not only have ample capital and money for our own purposes, but a surplus to invest away from home.

On the other hand, there are those who say that the silver issue must be dropped and the gold standard assented to in order to induce the investment of foreign capital in our enterprises. Such must therefore think that we have not capital enough in the country for our own purposes.

One thing is certain, and that is that there are almost numberless industries and enterprises offering returns that ought to be satisfactory but for some reason are not taken hold of. If it is not for want of capital or money, what is the reason? That our people are seeking investments in Cuba and elsewhere outside of our continental domain does not prove that we have more means than can be used at home to advantage. They go to these because so far as many enterprises like railroad building, mining, lumbering, et cetera, are concerned, they are practically virgin countries, and there are better prospects for larger profits than can be realized at home. Americans have so long enjoyed liberal income from their investments that they cannot readily submit to those that are moderate.

We have nearly passed out of the colonizing period so far as our continental domain is concerned, and it is hard for our people to submit to new conditions. Hence they want more room, new fields where they can practice their old habits. Their attention, therefore, is not directed to the investigation of what it is profitable to do in the era of organization such as we have entered upon. Profits of industries and trades are always less in an old and organized country than in one that is new and undergoing primary development. This is why Americans seek investments away, but it is noticeable that they do not go very much where they have not the protection of the flag of their own country.

It is true, a good deal of American capital is invested in Mexico, but chiefly in railroad and mining. That country is contiguous and the rights of American citizens can be more easily maintained than if their investments were in distant states.

As there are those who urge the adoption of policies that will induce foreign capitalists to invest here, the question arises whether such investments are desirable for us. No doubt while foreign capital is being expended times are improved, but the improvement is evanescent. The time speedily comes when interest and dividends have to be paid, and later the principal itself. Whatever profits foreign capitalists derive from their investments here is a *pro tanto* depletion of our wealth. The wiser policy then for our people is to promote the accumulation of money until the volume is so ample that there will be no inducement or room for foreigners to crowd themselves into enterprises.

That can best be done by promoting productions so as to have large surpluses for exportation, and making vigorous and systematic efforts to control foreign markets. To successfully develop our export trade it is necessary that we should have our own facilities for carrying on the high seas. In ship-building and in sailing ships our people will find room for abundant investment. We can rapidly acquire capital through industry and the husbanding of our resources.

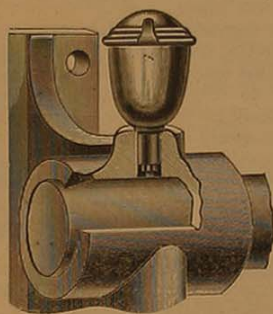
### THE ALBANY LUBRICATORS.

The Albany Lubricating Compound Cups cannot be excelled for beauty of finish or durability. They are made of the best sheet brass, zinc and galvanized iron for all journals requiring special sizes and shapes.

Messrs. Adam Cook's Sons issue an attractive booklet finely illustrated and containing much interesting data regarding their cups and compound.

The illustration herewith gives an interior view of the regular style of the spindle compound cup manufactured by the Albany Lubricating Compound Co., Adam Cook's Sons, proprietors, 313 West street, New York, N. Y., and which they advise being used with their Albany grease for the best results in lubricating machinery of all sorts.

The manner of attaching this cup is very simple, and can be done by any mechanic. A hole is bored through both the cup and brass of sufficient size to allow the outside tube of cup passage to shaft, observing in all cases that only the inside spindle rests on the shaft, the top touching the cup cover, the outside tube being shorter, and within one-quarter or three-eighths of an inch from the shaft. The inside spindle is then removed and the cup filled with the compound, then it is only necessary to replace the spindle with a few churning motions and the cup is ready for use. These cups require the minimum of at-



THE ALBANY GREASE CUP.

tention and cannot get out of order. When filled with the lubricating compound they will run from one to four months without refilling—according to the velocity of the shafting—thus effecting a great saving of labor as well as in the cost of lubrication.

The Albany Compound, unlike any other compound on the market, is a pure lubricant, and when used with the Albany cups no drip pan is required, as it is self-acting and runs only while the shaft is in motion; moreover, it is impossible for the bearings to become overheated, as it always feeds sufficient to keep the shaft cool. It is especially desirable for dynamos and other electrical and fast running machinery, as well as the heavy motor-power machinery of cableways.

The Albany Lubricating Compound is made in four regular and one extra numbers. No. 0 is very soft, being used in extreme cold weather; No. 1 is some harder, and is used on ordinary journals in cold weather or on very cool or slow-running journals; No. 2 is yet harder, and is the graderordinarily used in moderate and warm weather; No. 3 is adapted to the use of all stationary and marine engines, and it seldom fails to cool the warmest journals. The extra grade (No. x) is of extra hardness, and will lubricate journals with entire satisfaction where no other lubricant will work.

The *Independent* of Helena, Montana, publishes its budget of mining news regularly. A notable characteristic with the *Independent* is that it never publishes anything but reliable statements and makes every effort to obtain interesting items for its readers. We wish the *Independent* a prosperous year for 1899 and have no doubt that it will see one.

The great Randsburg Number of the *Los Angeles Mining Review* has at last been issued, and really it is a very creditable number for that publication. It contains fifty pages and cover, seems to be well supplied with advertising patronage and the whole is profusely illustrated. The cover is printed in blue and gold, showing a view of Randsburg looking north, and surmounted with a neatly designed heading.

Owing to increased business demands made upon Messrs. Baker & Co., the platinum refiners, to secure additional space, they have found it necessary to remove their New York office from No. 121 to 120 Liberty street.

They have on exhibition at the above address a number of specimens of crude platinum, among which is their large nugget, which is believed to be the largest nugget in any collection on the American continent.

The collection is very interesting to metallurgists, chemists and all persons interested in the different uses of platinum.

The *Western Mining Journal* is the latest venture launched upon the troubled waters of a Journalistic life at Denver, Colo. It proposes to fill a long felt want, though there are in Colorado numerous other mining publications, and Denver is headquarters of a couple of first-class papers devoted to mining, to say nothing of the space filled with mining news in the daily papers. However, there is room for more and we extend our hand in our best wishes for the success of the bright little publication above named. The make-up of the paper is excellent and if the issues to follow come up to the standard of the first, there is no doubt of the success it will attain.

The *Randsburg Miner* of January 28th, 1899, prints a description of the geology of the Rand district by Adolph J. Peter. It is an outline of the surrounding dynamical geology, the bearing it has on the Dike and Mineral vein formation of the California Rand mining district and its kindred mineral belt. On the whole it is well written and very instructive to the miner working on veins in the Rand district, as well as others interested there. THE MINING AND METALLURGICAL JOURNAL published the first geological sketch of the Rand district but as the camp was new and very little known about it at the time, the description was necessarily short, and the article printed by the *Miner* is given at a very opportune time.

### Water Required in Cyaniding.

For plain cyaniding, the water consumed per day is about that held in the pulp after draining, plus evaporation and wastage. The quantity of water retained in the pulp depends on the nature and fineness of the material. Tailings free of slimes will hold about 12 per cent. of its weight, and very clayey material up to 20 or 25 per cent., or more. A 20-ton plant for silicious oreholding, say, 15 per cent. moisture, would consume 3 tons of water per day (.07 miner's inches), besides wastage and evaporation. The quantity required for cyaniding is generally much less than for milling.



## UTAH PROPERTIES.

## Valuable Information Regarding Utah Mines.

The greatest industry of Utah thus far has been its mining. Its wonderful riches of metal and mineral are destined to make this as yet but half-explored territory the gathering place of capitalists and fortune seekers from every land beneath the sun. When fully known and developed, they will eclipse all the dazzling miracles of Aladdin and his magical lamp, and take their place among the wonders of the world. They will teach the children of this generation to smile at the fairy-tales that amazed their fathers and mothers, as trivial and tame, for they will be able to rub daily against the jeweled creatures of infinitely more marvelous stories in real life.

The greatest mines on earth are yet to be opened in the American Great West. Mountains of gold and silver ore, beside which all the famed riches of the Comstock Lode will some day sink to beggar's place, yet rear their proud heads to heaven—untouched by pick or spade or drill. The veritable treasure-houses of the gods yet await the enterprise and muscle of the sturdy prospectors and miners, who are destined, and that ever long, to fire the avarice and envy of the world with their Midas surpassing wealth of solid ducats. From Alaska to Nicaragua, the whole vast system of Rocky Mountains and Corilleras is an almost unbroken ore and mineral bed. Not one ten-thousandth part of it has ever felt the tap of a prospector's hammer. The surface dirt of California, Colorado, Utah, Idaho, Montana, Arizona and New Mexico mines is hardly broken; the glittering hoards are scarcely touched. The great bonanza fortunes are yet to be made.

The accidental turning of a loose stone among the bushes in Ontario Gulch, in Summit county, Utah, led to the discovery of one of the world's greatest bonanzas. The prospect hole was sold to a firm of which the late Senator Hearst, of California, was a member, for \$30,000; and as the Ontario mine, has since produced over \$30,000,000 in silver, and paid \$13,542,500 in dividends. Its mill and mining plant cost \$2,700,000.

Twenty-seven miles southwest of Salt Lake City, on the Rio Grande Western Railway, in the wild and picturesque Bingham Canyon of the Oquirrh mountains, lies the first mining district organized in Utah, and the Old Jordan mine in this canyon was the first mine discovered in the territory. Its oxidized surface ores, at its intersection with the South Galena, yielded \$2,000,000; and a million tons of quartz that will run twenty dollars a ton, now lie in sight in the same locality.

A short resume of the incorporated mines

paying dividends will not go amiss here. The facts to follow will show how great the storehouse of Nature is, that this enormous amount of wealth could be taken from the depths of the earth and never be missed. The first property to receive our attention will be the

## AJAX MINING CO.

Capitalization, \$3,000,000, divided into 300,000 shares of a par value of \$10. Principal office is at Salt Lake City, and the properties are situated near Mammoth, Tintic District, Juab County. Under the old Copperopolis regime, this mine paid \$1,000,000

low, of about 160 acres; located in Eureka, Tintic District, Juab County.

## CHLORIDE POINT CONSOLIDATED MINING CO.

Capitalization, \$500,000; divided into 500,000 shares, par value of \$1. The property is located near Mercur, on Lion Hill, Mercur District, Tooele County.

## DAISY GOLD MINING COMPANY.

Capitalization, \$1,500,000; divided into 500,000 shares of a par value of \$3. Property is composed of six patented claims, covering 2,000 feet of gold-bearing ledge, and is located in the Mercur region, Tooele County, with the main office at Omaha, Nebraska.

## DALY MINING COMPANY.

Capitalization, \$1,500,000; divided into 150,000 shares of a par value of \$20. The principal office is in Salt Lake City, and the property is located near Park City, Summit County.

## DALY-WEST MINING CO.

Capitalization, \$1,500,000; divided into 75,000 shares of a par value of \$20. The principal office is at Salt Lake City; property joins the Ontario ground on the west and consists of an hundred acre tract located in Park City, Summit County.

## DALTON GOLD MINING AND MILLING CO.

Capitalization, \$2,500,000; divided into 500,000 shares at a par value of \$5. Principal office at Salt Lake City; property consists of four patented claims, and a mill-site on Bullion Creek; located in Ohio District, Piute County.

## DALTON AND LARK MINING AND MILLING CO.

Capitalization, \$2,500,000, divided into 2,500,000 shares, at a par value of \$1. Dividends prior to January, 1899, \$75,000; last paid, August, 1897. Principal office is at Salt Lake City. The property, composed of thirty-two patented claims, is located in Salt Lake County; West Mountain District.

## DE LA MAR MERCUR MINES COMPANY.

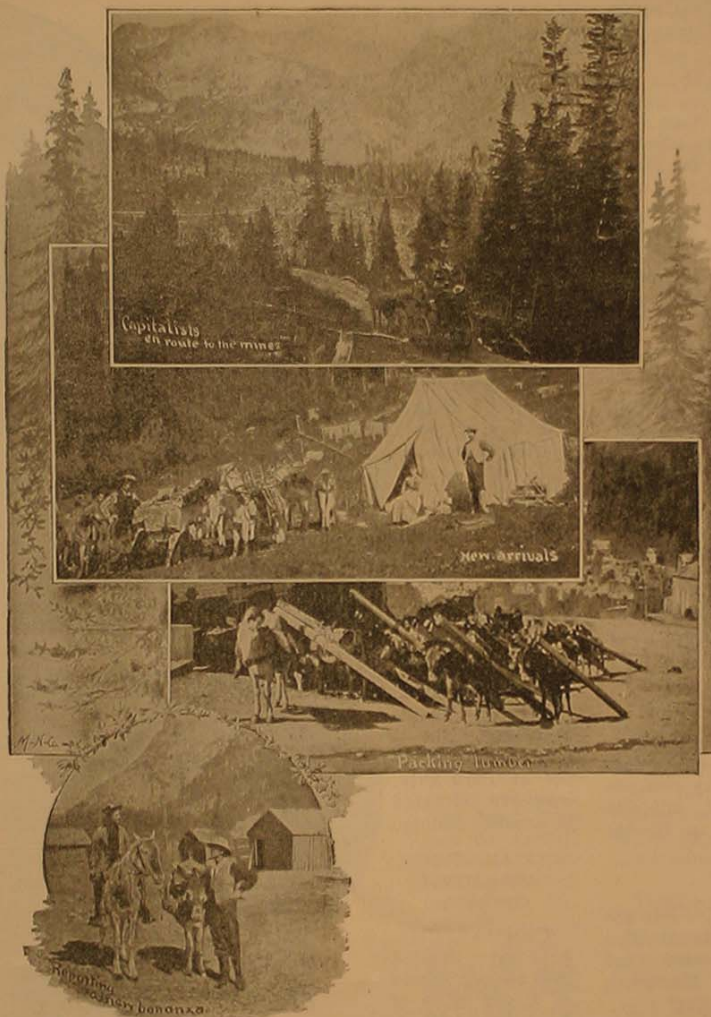
Capitalization, \$250,000, divided into 2,500 shares at a par value of \$100; principal office at Jersey City, N. J., and the main business office at Salt Lake City, located in Mercur Region, Tooele County.

## EAGLE AND BLUE BELL MINING CO.

Capitalization, \$250,000, divided into 250,000 shares at a par value of \$1; incorporated 1898; principal office at Salt Lake City. The property consists of nine patented claims, two smaller claims and two mill-sites, located in Tintic District, Juab County.

## FOUR ACRES MINING COMPANY.

Capitalization, \$300,000, divided into 300,000 shares of a par value of \$1; property



in dividends, but the new company has paid nothing as yet. Following this property we will take them in alphabetical order.

## BULLION-BECK AND CHAMPION MINING CO.

Capitalization, \$1,000,000; divided into 100,000 shares of a par value of \$10. Principal office at Salt Lake City.

This property has paid \$10,000 per month for the past few months, and is located at Eureka, Juab county, Tintic District.

## CONTINENTAL-EUREKA MINING CO.

Capitalization, \$1,500,000, divided into 30,000 shares of a par value of \$50. Principal office at Salt Lake City; the claim lies to the south of Bullion-Beck, and extends on the dividing ridge between the Eureka and Mammoth Hol-



composed of two patented claims and two in the process of patent; located in Juab County, Tintic District, with principal office at Salt Lake City.

#### GALENA GOLD MINING COMPANY.

Capitalization, \$1,000,000; divided into 100,000 shares, at a par value of \$10. Principal office at Salt Lake City; property located in the Fish Springs District, Juab County.

#### GEYSER MARION GOLD MINING AND MILLING COMPANY.

Capitalization, \$1,500,000, divided into 300,000 shares at a par value of \$5; incorporated February, 1897; property composed of the the opposite or north side of Lewison Canyon from Mercur ground; located in Mercur District, Tooele County.

#### GRAND CENTRAL MINING COMPANY.

Capitalization, \$250,000, divided into 250,000 shares at a par value of \$1. Principal office at Provo, Utah; property located in the Tintic District, Juab County.

#### HOMESTAKE MINING AND MILLING COMPANY

Capitalization, \$400,000; divided into 400,000 shares at a par value of \$1. Principal office at Salt Lake City; property consists of five claims and a bond on the Ida May tract, located in Juab County, Tintic District.

#### HORN SILVER MINING CO.

Capitalization, \$10,000,000, divided into 400,000 shares, at a par value of 50 cents each. Principal office at Salt Lake City; property located in Mercur Region, Tooele County.

#### JOE BOWERS MINING CO.

Capitalization, \$400,000; divided into 400,000 shares at a par value of \$1. Principal office at Salt Lake City. Property consists of four claims, one patented, viz: Joe Bowers; the others are Joe Bowers No. 2, Hardtack, and Johnson, situated in the Tintic District, Juab County.

#### LITTLE PITTSBURG MINING CO.

Capitalization, \$2,000,000, divided into shares of a par value of \$5 each. Principal office is at Salt Lake City; property consists of about 120 acres on Lion Hill, opposite Chlorine Point holdings, situated in Mercur Region, Tooele county.

#### MAMMOTH MINING CO.

Capitalization, \$10,000,000, divided into 400 shares at a par value of \$25. Principal office at Salt Lake City. Property composed of ten patented claims, near the head of Mammoth Hollow in Tintic District, Juab County.

#### MERCUR GOLD MINING AND MILLING CO.

Capitalization, \$5,000,000, divided into 200,000 shares at a par value of \$25. Principal office at Salt Lake City; property composed of thirteen claims amounting to 156 acres; located in Mercur Region, Tooele county.

#### NORTHERN LIGHT GOLD MINING & MILLING CO.

Capitalization, \$2,000,000; divided into 400,000 shares at a par value of \$5; principal office at Salt Lake City. Property on Lion Hill in Mercur District, Tooele County.

#### OMAHA GOLD MINING CO.

Capitalization, \$500,000 divided into 300,000 shares at a par value of \$5. Principal

office at Salt Lake City. Property composed of six patented claims in the Mercur Region, Tooele County.

#### ONTARIO SILVER MINING CO.

Capitalization, \$15,000,000; divided into 150,000 shares at a par value of \$100. Principal office at San Francisco; branch office at New York, and a business office at Salt Lake City. Property is composed of 435 acres in Summit County and 451 acres in Wasatch County, patented; situated near Park City, Summit County.

#### OVERLAND GOLD MINING AND MILLING CO.

Capitalization, \$2,000,000; divided into 400,000 shares at a par value of \$5. Principal office Salt Lake City; property composed of eleven claims located in Mercur Region, Tooele County.

#### SACRAMENTO GOLD MINING AND MILLING CO.

Capitalization, \$1,500,000, divided into 300,000 shares at a par value of \$5. Principal office at Salt Lake City. Incorporated February, 1897; property consists of 100 acres on opposite side of Lewison Canyon from the Mercur ground; located in Mercur District, Tooele County.

#### SILVER KING MINING CO.

Capitalization, \$3,000,000; divided into 150,000 shares at a par value of \$20. Principal office at Park City. Property situated in Summit county.

#### SUNBEAM CONSOLIDATED MINING COMPANY.

Capitalization, \$250,000; divided into 250,000 shares at a par value of \$1. Principal office is at Salt Lake City; property consists of 750 feet on the old Sunbeam, patented, and eighteen acres, in process of patent; located in Tintic District, Juab County.

#### STAR CONSOLIDATED MINING CO.

Capitalization, \$500,000; divided into 500,000 shares at a par value of \$1. Principal office is at Salt Lake City; property is composed of nine patented claims and a two-thirds interest in five others; located in Juab County, Tintic District.

#### SUNSHINE MINING AND MILLING CO.

Capitalization, \$2,500,000; divided into 250,000 shares at par value of \$10. Principal

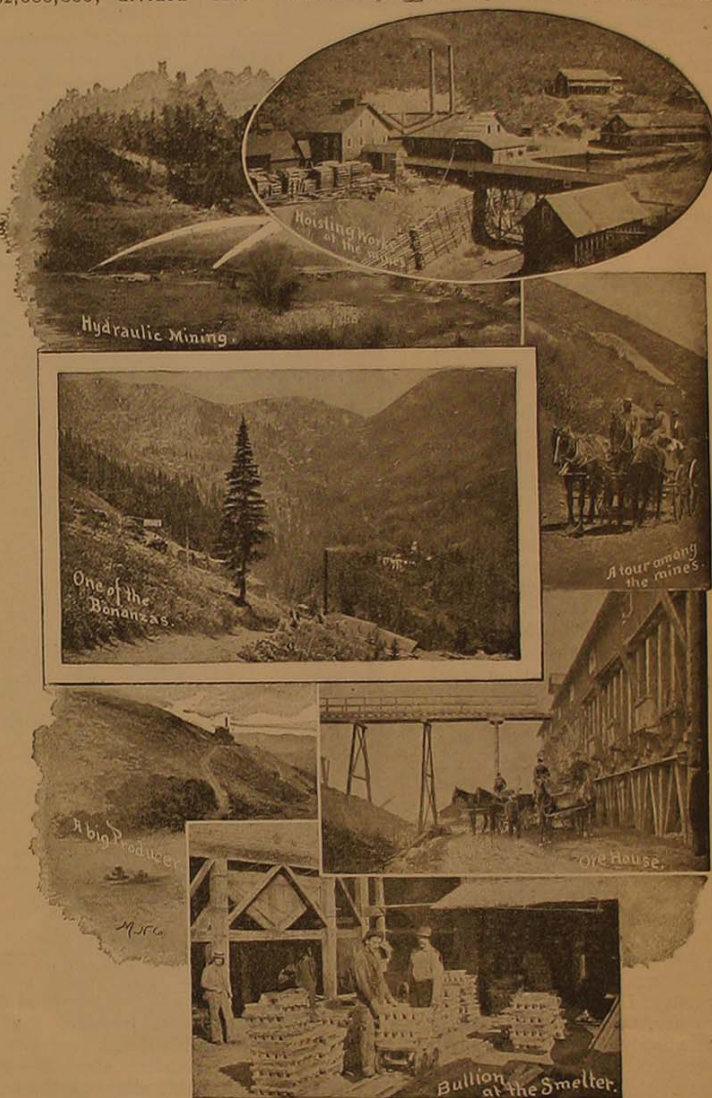
office at Salt Lake City; property consists of six claims, located in Mercur Region, Tooele County.

#### SWANSEA MINING CO.

Capitalization, \$500,000; divided into 100,000 shares at a par value of \$5. Property consists of four claims in Silver City, Tintic District, Juab County.

#### SOUTH SWANSEA MINING CO.

Capitalization, \$150,000 shares at a par value of \$1. Principal office at Salt Lake



City. Property is located south of the the Swansea in Tintic District, Juab County.

#### TETRO MINING CO.

Capitalization, \$300,000; divided into 300,000 shares at a par value of \$1. Principal office at Salt Lake City. Property consists of four patented claims situated to the west of Godivia, located in Juab County, Tintic District.

#### UTAH MINING CO.

Capitalization, \$1,000,000; divided into 100,000 shares at a par value of \$10. Principal office at Salt Lake City. Property joins



that of the Galena, and is located in the Fish Springs District.

#### VALERO MINING CO.

Capacity \$200,000, divided into 200,000 shares at a par value of \$1. Principal office at Park City. Property consists of over 150 acres, mostly patented; located in Wasatch county, on the western edge of Summit County, four miles east of Park City.

#### WEST MOUNTAIN PLACER CO.

Capitalization, \$100,000; divided into 200,000 shares at a par value of \$1. Principal offices at Salt Lake City. Property is composed of a group of placer claims, in Bingham

ing as formerly, the management has decided to put up a smelter of its own, and while all these operations are under the one company, the smelting business will be run as a separate and distinct department.

Fifty-six acres of land on a bluff of the Jordan river, near Murray, was secured as a site for the smelter. The location is only one mile from the two railroads, from which a spur track was put in before beginning the collection of materials for the plant. The ground for the smelter was broken in August last, and the work of building has been going on ever since. The plans are something after the Boston & Montana reduction works at Great Falls, Montana, and were designed by

Chief Engineer George K. Fischer, who was connected with the Montana plant several years.

The plant proper covers a space about 600 x 800 feet. A brief outline of this copper smelter will give the reader some idea of its extent.

It is so designed as to have all material in form of ores, coal, fluxes, etc., brought in by rail in self-dumping cars to be run onto an elevated track 21 feet above ground and the car contents be dropped into bins underneath the track.

These bins have a capacity of over 3000 tons and are raised enough to empty into small cars run by electric trolleys, thus making the collection of furnace charges easy. All ores go to the large sampler, where crushers and machinery do the work, after which it is raised

30 feet by an elevator of eight tons capacity, trammed over the top of the great roasting building to pass through the three Wetley automatic roasters of 100 tons capacity each.

After roasting, link belts convey to the calcined bins to be afterward drawn off, elevated 18 feet and trammed to the three reverberating matte furnaces, from which the slag is run off and drawn out, while the matte is turned out at about fifty per cent. copper.

This matte, when drawn from the furnaces, is taken by an electric crane to the converters, where the air blast is turned on and the mass is refined down to about 99 per cent. copper, then run into bars of bullion ready for ship-

ment. This electric overhead crane has a span of thirty feet and a capacity of forty tons with three tracks, and travels the entire length of the 235x60 foot building.

In constructing the several buildings they are located separately around a steel chimney 175 feet high and 16 feet in diameter, to which all the spent gases from the furnaces are conveyed through long flumes and dust-chambers.

The power plant has one 350-horse power engine to run the blower, a 400-horse power engine to run the dynamo, all machinery about the plant being operated by electricity. These engines are compound condensing, water being supplied by two artesian wells, and after using is cooled by an immense cooling tower of novel construction.

The business done by the different smelters of Utah in 1898 can be considered excellent, but no doubt 1899 will eclipse anything heretofore accomplished. Each of these during the past year made important changes and additions, and now they are about as perfectly equipped for economic reduction of ores as any in the United States. There is now in process of construction another plant to be equipped for handling ores carrying a good per cent. of copper, hence materially differing in its operations from the three old smelters which have handled silver-lead ore chiefly.

#### GERMANIA LEAD WORKS.

This old plant was operated continuously during the year, with only slight interruptions in the summer, when two of the furnaces were disabled and the building so gutted by fire as to require rebuilding, entailing a loss of a few thousand dollars, besides the temporary suspension of bullion production.

During the year five new Buckner cylinder roasters were added to the plant, the same being covered by a new iron and steel building; also additional smelting capacity by building one new smelting stack, No. 8, with iron and steel building to cover it. These were important and expensive improvements, adding much to the great plant in capacity and convenience in operating.

The output of the Germania lead works for the year 1898, is as follows:

#### Base bullion—

Lead, pounds.....	30,981,700
Copper, pounds.....	4,095,200
Silver, ounces.....	2,742,514
Gold, ounces.....	22,093

Total pounds bullion.....37,841,507

Comparison of this with the production in 1897 shows as follows:

	1897	1898
Lead, pounds.....	25,089,700	30,981,700
Copper, pounds.....	2,442,232	4,095,200
Silver, ounces.....	2,049,985	2,742,514
Gold, ounces.....	11,896	22,093

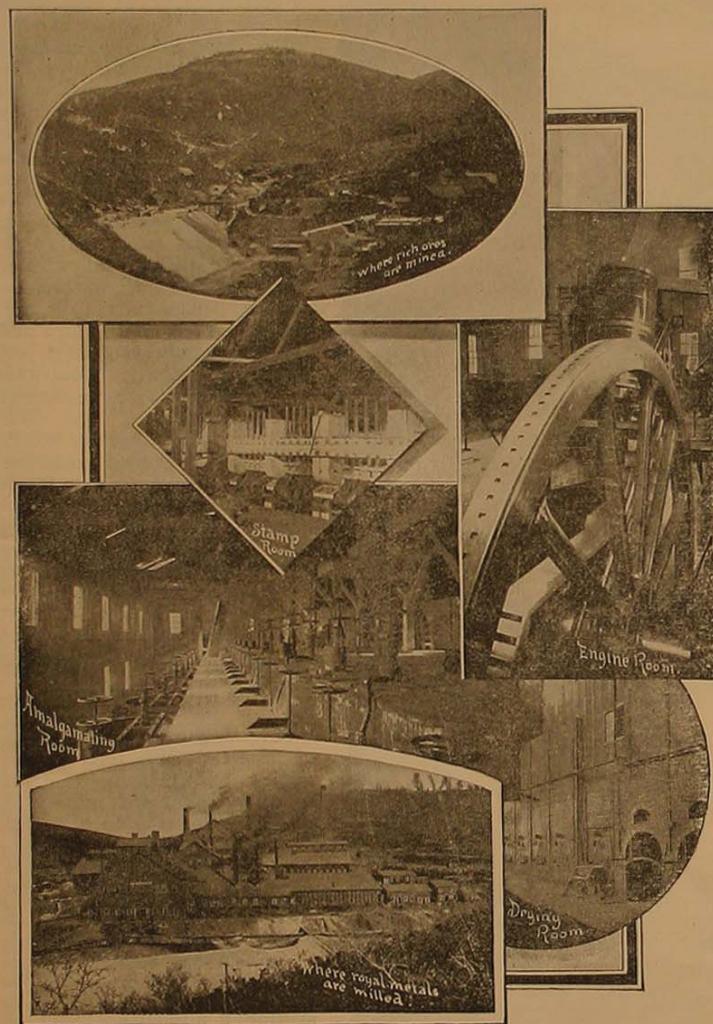
This comparison shows increases of about 22 per cent. on lead, over 90 per cent. on copper, a slight increase in silver and nearly 100 per cent. in gold.

#### HANAUER SMELTER.

The output of the Hanauer smelter in 1898 was:

Lead, pounds.....	8,656,088
Copper, pounds.....	283,650
Silver, ounces.....	636,900
Gold, ounces.....	4,530

Comparison of this with that of 1897 shows as follows:



Canyon, below Bingham, of 350 acres; located in Salt Lake County, West Mountain District.

On account of our limited space, we are compelled to leave out a few properties that are not attracting much attention at the present time, and cannot review many items of interest, but the following important work accomplished and in progress may interest our readers.

#### THE HIGHLAND BOY SMELTER.

On account of a change in the character of the ore in the Highland Boy group at Carr Fork, Bingham, from gold to copper, necessitating the smelting of the ore instead of mill-



	1897	1898
Pounds lead.....	13,292,000	8,656,088
Pounds copper.....	678,150	283,650
Ounces silver.....	835,500	636,530
Ounces gold.....	7,677	4,530

## PENNSYLVANIA LEAD CO.

Comparison of products for last two years:

	1897	1898
Lead, pounds.....	12,462,360	11,366,000
Copper, pounds.....	191,945	253,000
Silver, ounces.....	951,070	1,022,113
Gold, ounces.....	14,146	9,371

In these comparisons it is interesting to note the very great increase in copper and gold since these two metals are being sought for so zealously at present.

In looking over the mining industries of Utah one familiar with the entire situation cannot help but believe that the State is just now in a pretty happy condition as a mining country, with the exception of the price of silver being adverse. Still, the product of gold, silver, copper and lead is put by Wells, Fargo & Co., during 1898 at \$9,277,443.87, as compared with \$8,263,683.82 for 1897, an increase of \$1,013,760.05.

Turning away from minerals, one may find a very hopeful sign in what the coal miners are doing and the prosperity the coal men are reaping. Take the increase of over 100,000 tons of coal produced in 1898 over that of 1897, an increase of about 20 per cent., and then inquire where this extra demand comes from, and it can be traced, at least most of it, to the increased activity and prosperity in mining for precious metals in Utah.

Take the mining districts of the state, and we find Tintic leading off with 5145 carloads of ores shipped in 1898 against 3342 cars in 1897. There were 29 shippers in 1897 and 41 last year, a gain of over 50 per cent. in tonnage, and about 45 per cent. in number of shippers.

The district comes forward with \$633,750 paid in dividends by companies making public reports, while there were many thousands more divided among themselves by private corporations or individual owners of mines.

Park City, with all its disasters of the past two years, sent out nearly 40,000 tons of ore, and its greatest mine paid \$450,000 in dividends.

Bingham had an increase in its tonnage of over 10,000 tons, its total for the year being 55,453 tons. Mercur, starting with a combined milling capacity of about 740 tons per day, has increased fully 300 per cent.

Aside from the gold, silver, copper and lead found in Utah, the Great Salt Lake could supply the world with salt, and never miss it. At Salina, on the San Pete Valley branch of the Rio Grande Western Railway, there are five mountains, vast Wasatch peaks of solid rock salt so pure and clear that one can read through a block of it; and

vast deposits are found near Nephi and in a number of other regions. The winds sometimes in a single night pile up hundreds of tons of sulphate of soda on the shores of Salt Lake; and just below Manti, on the Rio Grande Western Railroad, the whole earth is covered with an efflorescent soda sufficiently pure for household use.

Copperas, or what is known as green vitriol, almost pure and in large quantities, has been found in Spanish Fork Canyon. Roofing slate of unsurpassable quality and of many colors abounds on Antelope Island. Ozokerite, or mineral wax, has been discovered near Soldier Summit, on the Rio Grande Western

hunters bring reports of a great lake of asphaltum, somewhat like that of Trinidad, in the Green river region, in which the cattle get stuck like flies on sticky fly-paper.

Near Agate Station, on the Rio Grande Western Railway, are thousands of acres of superb water agates. Some specimens five feet in diameter, flawless and beautifully tinted, have been found, and among them cornelians, one of which measured five inches across.

But why go on with the enumeration? It would require a volume as big as an unabridged dictionary to hold the mere muster-roll of Utah's resources and products.

There is scarcely anything in all the catalogue of human needs or greeds that is not supplied in this vast Deity-made storehouse.

Reference has been made to old and well-known mining districts. There are others on the eve of prosperity, if not already enjoying it. Frisco, while moving steadily along with its great Horn Silver, has a new sensation in the Washington, just developing into a great, rich mine. The La Sals are attracting attention to their merits. The Colorado river is promising in placers. Some of the old districts are being rejuvenated and are giving great results.

The Deep Creek country is still handicapped for the lack of a railroad.

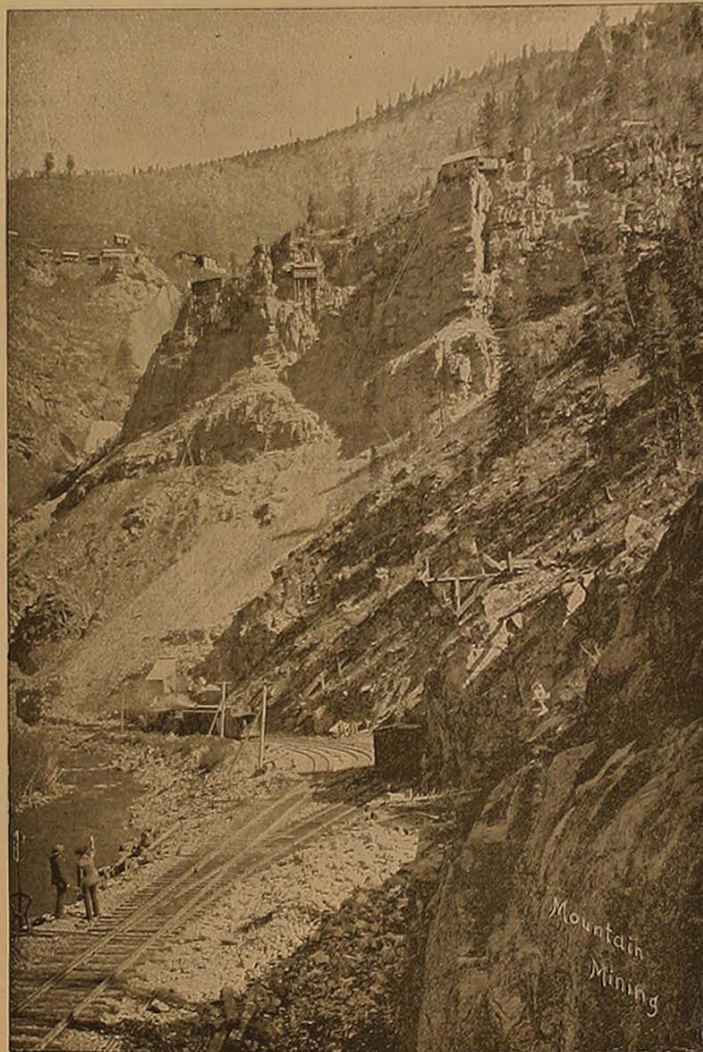
Through the courtesy of F. A. Wadleigh, general passenger agent of the Rio Grande Western Ry., we have secured the beautiful half-tone engravings herewith presented, and have drawn upon numerous sources for the matter accompanying the same.

#### The Cleveland, Ohio, Mining and Stock Exchange.

Several gentlemen, residents of Cleveland, Ohio, interested in mining and believing that if properly conducted mining is one of the safest and surest businesses of the day, have determined that so far as Cleveland is concerned, spurious stocks and worthless mines shall not find a market.

In consequence of this resolve they have organized a mining exchange with the object of making it a reliable bureau of information where both miner and investor can meet and transact business.

It is also the intention of the exchange to keep on file records and statements of the exact conditions of all mines, and the values of the various mining stocks. The Exchange proposes to help the miner bring his property before reliable and square-dealing capitalists, and it is expected that many of the mine-owners desiring to bring their properties before those interested in mining matters will become members of the Exchange. The Cleveland Mining & Stock Exchange seems to have very laudable objects, and conducted on the above outlined policy can be made very serviceable to legitimate mining interests.



Railway. It is proof against water, air, acids, and can be used to render other fabrics equally impervious. It is a perfect insulator.

It is largely utilized for phonograph cylinders and cathedral candles. In its natural state it is black and waxy; when refined it becomes white and almost translucent. No ordinary heat softens it. The only other known deposit of it in the world is in Russia, and is said to have yielded \$300,000,000. Gilsonite, named for the veteran prospector, Sam Gilson, who discovered it, is found in exhaustless quantities near Price Station, and a number of other places. It is said to be 99 per cent. pure asphaltum. Cowboys and



## CORRESPONDENCE

## CALIFORNIA.

LOS ANGELES, CAL., Feb., 1899.

EDITOR JOURNAL:—The Exposition to be opened early spring in Paris, 1900, bids fair to excel in every department all other efforts of the kind that ever preceded it.

The official space, however, is scarcely more than one-half of our Columbian "White City" of 1893. To offset this shortage of square feet, the location of that which is available constitutes the exact geographical center of the most densely populated part of Europe, and for the season of 1900, more than ever before, it will hold true that Paris is the center as well of all the best attractions that embellish and dignify civilization at large. Fools will abound in Paris then as always, but they will be more than outnumbered by the patient student, the accomplished scholar, the man of affairs in all departments of human activity by the capitalist, and in greater degree than at any similar occasion of the world's history, the members of the hardest-worked and least compensated profession, the newspaper correspondent will be there—the illustrated monthly, weekly and all the world's great dailies.

At the exposition of 1879, the first exposition under the present republic, the writer held a "Card of Correspondents' Privileges," No. 3337. There were then in all not less than 5,000 accredited newspaper representatives from abroad present. This was twenty years ago. To assume that the newspaper men of the world who will be present in 1900 will aggregate upwards of 20,000 would seem therefore, a moderate estimate.

The advertising value of such a force of trained writers is beyond calculation. The question is exceedingly pertinent, therefore, to the mining community of Southern California, and the United States South-west, and North of Mexico in general. What can we do to get the advantage of this, the greatest of the world's focus.

The first pre-eminent consideration is that, if the heavy mining interests of the vast areas referred to desire to be creditably represented on this truly auspicious occasion, they have not one hour to lose. All exhibits must be collected, classified, and passed on by adequate jury, and be ready for official entrance in Paris, just one year hence this very month, February, 1899.

Second: The Honorable Ferdinand W. Peck, the United States Commissioner General of the Paris Exposition, has selected for chief of this very department the same gentleman who made the mining exhibit at the Columbian Exposition the conspicuous success it was, Hon. J. V. Skiff, formerly of Colorado, now Director-in-Chief of the Field Museum of Chicago, as well as first executive officer on the Commissioner General's staff. The miners, therefore, of the United States, have indeed a powerful friend at court, but even he cannot help those who neglect to help themselves, or who fail to recognize the urgency of prompt and vigorous action in the premises.

Evenhanded justice to all legitimate interests of the United States at large, and every part thereof, is the watchword at the Paris Exposition headquarters of the United States, the Auditorium, Chicago; but more emphatic than the phrase was ever applied to any enterprise whatever, it must be remembered in this case that time waits for none, not even for the brave pioneer miners of the Southwest

United States, who against obstacles of the most extraordinary kind have literally achieved truly magnificent results.

The actual official space allotted the United States at Paris, under the head "Mines and Metallurgy," comprises 7,700 square feet. If this seems inadequate, comparably to the vastness of the mining interests of the United States, it must be borne in mind that quality rather than quantity is necessarily enforced in every department. Further, there is granted to "Machinery and Electricity" 48,000 feet; to "Civil Engineering and Transportation," 16,000. That in a measure at least, mining interest will be subserved directly and indirectly through the two last-named departments would seem probable. But of course, the active, practical miner, more especially in precious metals, will naturally have his product become classified under the regular department devoted exclusively to "Mines and Metallurgy."

It is understood, however, that some exceedingly valuable space can be obtained for private display of exhibits of mineral products which, while creditable otherwise, may fail to find room at the official and therefore competitive space. This latter unofficial accommodation is located in and constitutes practically part of the inclosed premises of the Exposition grounds proper. The standing of the private owners of this ground, which can be leased, is vouched for respectively by the Director General Picard, of the Paris Exposition, and the Commissioner General of the United States, through whom the negotiations for this space must be conducted.

In a further issue of the MINING AND METALLURGICAL JOURNAL the writer may, with the continued courtesy of the editor, go a little farther into the details of this last-named space of private concessions. At present, he will only add that a great opportunity is apparently to be had in that very direction, even though it may involve some extra expenditures.

When Fremont turned his exploring caravan southward from Sutter's Fort, 1844-45, returning "Back to the States," by way of the San Joaquin Valley, along the western base of the Sierra Nevadas, thence by the Tejon Pass, through the Tehachapi Range, out on the Mojave Desert, thence northward over the old "Salt Lake Trail," up to the great lake from where he had started, he little realized the hidden treasure vaults to the right and to the left of the very trail he was passing. Neither do we of the present begin to realize what the future has in store for the seeming hopeless deserts on the eastern base of the Sierras, the Sierra Madres and the San Bernardinos. We can only infer the future from the past, but what the probabilities are is just about to be forcibly illustrated in Australia. In the heart of a country that has clearly been subject to the same geological forces that have operated in our own southwest, and which on this score is largely its physical counterpart, there opens next month, March, 1899, an International Mining Exposition. Reference is here made to the Coolgardie (Mining Exhibition), Western Australia. Its total exhibiting space covers 235,900 square feet. When through with the Exposition, the structure in question becomes a permanent mining museum and a school of mines. Such are some of the latent possibilities of the "barren deserts." Let us be up and doing.

OLAF ELLISON,

Special Representative to the Pacific Coast of the Paris Exposition.

## Miners, Attention.

SAN FRANCISCO, CAL., Feb. 6, '99.

EDITOR JOURNAL:—I see by the press that there is some discussion going on in Southern California, regarding the organization of a Southern California Miners' Association. I had intended writing you ever since the last convention regarding this matter, but have been so busy with the Association affairs that I have not had time to do as I desired.

I should like very much to have every county in Southern California represented in the State Miners' Association, and I see no reason why this cannot be done. I am ready and willing at any time to come to Southern California, for the purpose of organizing branch organizations, and if I only knew the proper people to communicate with regarding this matter, I should take very great pleasure in trying to work it up.

There are large mining interests in San Diego, Kern, San Bernardino, Riverside and other Southern counties, and it seems to me that the State Association's work should not be carried on for the interests of the Northern Miners' alone.

It is well known what work has been accomplished by the Association, and we now have very important matters before Congress and the State Legislature, which will be of vast benefit to the mining industry at large, and I think it would be far better to have the whole State unite in one Association, instead of having individual organizations working for the same purpose.

If you can give me the addresses of some of the mining men in the South, who would be likely to take active parts in organizing branch Associations, I shall take pleasure in communicating with them at once, and see if it is not possible to perfect organizations in conjunction with the State Association in the southern counties.

Trusting this will meet with your approval, and hoping to have your hearty co-operation, I remain, with kindest regards,

Yours very truly,  
(Signed) EDWARD H. BENJAMIN,  
Secretary.

NOTE.—We hope the miners of Southern California will avail themselves of this proposition from the State Association, and send in their names and addresses to the editor of the JOURNAL.—ACTING ED.

## UTAH.

SALT LAKE CITY, UTAH, Feb. 3, 1899.

EDITOR JOURNAL:—The Utah mining share market this week had several checks. This will do good and will prevent such wild speculations as was threatened. The majority of the operations are still on the bull side and the abundance of cheap money seeking investment warrants this position; but the developments this week demonstrate that there are two sides to the market.

Ajax continues inactive. A movement in the stock is looked for soon, as it is reported that about 300 tons of high-grade copper ore are in the bins and will soon be placed on the market. Alliance, it is reported, will soon increase its capitalization from 100,000 to 150,000 shares and the 50,000 shares will be sold for the purpose of acquiring funds to continue development work.

Bullion-Beck was a trifle stronger and in fair demand. The stock will bear keeping in mind. Buckeye is threatened with a lawsuit.



Centennial-Eureka was inactive. The mine is reported to be in fine condition with gold and silver values increasing. A dividend will be paid this month. Chloride Point was stronger. Another upturn in this stock is expected. Dividend expectations may be realized in the near future, and the shares at \$1.50 is among the probabilities.

Daisy was stationary. An absorption of all offerings was unusually persistent. Daly was in strong demand by believers in the story of resumption of operations. Daly West was pretty strong. The special stockholders' meeting on the 31st ult., called for the purpose of empowering the directors to purchase the other undivided half of the property through issuance of an equal number of shares as represented in the present corporation, was carried through without a dissenting vote. The annual meeting will be held on the 20th, and the officers of the consolidated company will be elected on that date.

Dalton & Lark was in strong demand. Dalton eased off on free offerings. Dexter was strong, although not particularly active.

Eagle continues to ease. Eagle & Blue Bell holds steady around \$2.00. Four Aces was one of the most active stocks on the list. Geyser-Marion took a sudden downward plunge, owing to the last cyanide shipment being lower in value than has of late been coming from the mine. Galena was unchanged. Golden Eagle made a slight advance. Grand Central was very soft, owing, it is said, to a change in the ore showing in the mine. Homestake was steady. The knowing ones predict very much higher prices on this stock. Their belief is based solely on the report that a prominent operator is said to have acquired control and will push developments. There was some inquiry for Horn Silver. Joe Bowers dipped quickly on the report that the claimant who recently appeared, demanding a half interest in the property, in point of law, is likely to make his claims stand. Joe Bowers Extension was stronger and an active seller during the week.

## Miscellaneous Mining News.

### ALASKA.

George Bach, manager of the Alaska and Indiana mines at Berner's Bay, reports everything progressing nicely at all the mines. A ten-stamp mill, a saw mill and all the necessary appliances are on the ground ready for the spring work, and business prospects for the coming year at the Berner's Bay mines are very flattering.

In his official report to the department of the interior, Gen. Charles D. Walcott, director of the U. S. Geological survey, has the following to say of the Taku trail. The report was filed as late as July, 1898, and is accompanied by a correct government map published as his report is by the government and is absolutely reliable in every detail.

The Taku route ascends the Taku Inlet and river, and crosses directly to Lake Teslin; thence it is identical with the Stickeen route. By the Taku route one travels by steamer from Juneau 18 miles up the Taku inlet, thence by boat 60 miles up the Taku river to the end of navigation. The portage which follows is for 20 miles through the canyon-like valley of an eastern branch, thence up the broad valleys of the upper Taku. The last 15 miles is through the densely wooded valleys of the Atlin Lake district. The Taku route is practicable for a railroad and a char-

ter for one has already been granted by the Canadian government. Both this and the Stickeen route have the undoubted advantage of avoiding the hazardous summit and the dangerous White Horse Rapids.

### ARIZONA.

#### New Copper Company.

Articles of incorporation of the North Bisbee Copper and Gold Mining Company were filed in the office of the secretary of the territory the other day. The incorporators are J. R. Ghiselin, J. W. Dunlap, George C. McNamara, W. A. Hallowell, Jr., Henry Lee, C. C. Wright and D. W. Mitchell. Bisbee and Los Angeles are the two principal places of business. The capital stock is \$1,000,000; shares \$1 each.

#### A Mining Deal.

Joseph Cope last week completed the sale of his two mining claims, the Christmas and the Good Luck. He sold the mines to Frank H. Trego for a consideration of \$35,000, being a cash sale. The claims are located at Tonto Basin in a rich region, and have been developed by Mr. Cope. These mines run free gold and concentrate ore and the outlook for the property is good. Mr. Cope has been a very successful mining man and is the owner of some rich gold mines in the Silver King locality.

### CALIFORNIA.

#### RIVERSIDE COUNTY.

The Pinecate district is forging ahead in proper style. The Good Hope property is showing up better than ever.

The English syndicate who own the Gavilan grant—The Riverside Gold Mining Co.—propose developing their property more extensively and will continue the shaft on down. Their 10 stamp mill is running steadily, producing the yellow metal in a way that would make many an old miner's heart glad.

#### SAN BERNARDINO COUNTY.

##### Virginia Dale Notes.

From parties recently from this very interesting mining section, the following interesting notes were told our representative while at Beaumont:

The camp at present has a population of about 150 people. There are four stamp mills; three have only two stamps, the fourth one. There are two general merchandise stores, post office, one restaurant and lodging house, an assay office and two saloons, of course.

At this season of the year the work is progressing with all possible vigor. There is plenty of water to be had by digging down from one hundred to one hundred and twenty-five feet. It never fails.

The Leota is a very promising mine which is making a good showing.

A very fine specimen of iron ore from there was also shown us. It is said that there is enough of it to build another transcontinental railroad.

#### SAN DIEGO COUNTY.

Without a great deal of noise and with no excitement whatever, the Julian and Banner mining districts are passing through a period just now that bears every indication of being

the dawn of a time of great activity, not to say excitement. For 27 years the mines of Julian and Banner have been worked in a desultory sort of fashion. As everybody knows, a great many of the mines have paid from the "grass roots," as miners say, and although a good many properties have been abandoned from time to time, still it is a well known fact that over \$3,000,000 have actually been taken out of the two camps since they were located in 1871. It is extremely doubtful if there is another district in Southern California that can show such results when the comparatively small outlay is taken into consideration.

With one or two exceptions none of the mines of that region have yet been exploited or developed to any considerable degree, and as a result capital, which is always timid and wants to know details and facts instead of generalities and theories, has refused to visit Julian.

Of late, however, things seem to have taken a little turn, and perhaps the most important move of all is the conditional sale of the Helvetia mine and mill to Egbert Moore & Co. of Denver. Mr. Moore represents a company with plenty of money, and, strange to say, the people who propose to buy the mine are so confident of the value of the property that they have already spent probably \$1,500 in pumping out the water and retimbering portions of the main shaft, and are now running a large force day and night pumping out the 80-foot winze and getting the entire mine in first class shape.

The mine is positively known to contain a vast amount of rich free-milling ore, and all that has prevented its profitable operation long ago is the fact that the owners did not have sufficient capital to put the property in satisfactory condition. Now, however, that there is every indication that the deal will be finally closed in a few days, other capital is looking in this direction.

### COLORADO.

As is usual, the rich strike made in the Isabella mine at Colorado Springs, is not so phenomenally rich as first reported. Director W. F. Jacobson says that several tons of ore have been broken down that will run \$6,000 per ton and upwards. Some of it will go \$1,800 and seventy-eight feet of the ore will give \$900. The highest assay, made on the 27th of January from a picked specimen, went \$100,000, and was taken from the small rich streak.

The Mabelle lode, situated about two miles north of Puma City, Park county, has been sold by Frank Adams, now of Cripple Creek, to Albert Wyers of St. Louis. The consideration was \$5,000.

#### New Mining Company.

Articles of incorporation for the Poorman Mining and Leasing Company were filed the latter part of January by Ed P. Creighton, T. F. Creighton and C. E. Tschudi. The company is capitalized at \$10,000, divided into shares of the par value of \$1 each. A general mining business will be transacted with headquarters at Manitou.

#### The Puritan M. & L. Co.

The Puritan Mining and Leasing Company was incorporated in January, papers being filed in the office of the county clerk of El Paso county. The incorporators are Charles W. Smith, Joseph L. Brown and L. E. C. Hinck-



ley. The capital stock of the company is placed at \$60,000, and the following board of directors is named: C. W. Smith, J. L. Brown, C. V. Cole, Fred J. Heffson and L. E. C. Hinckley.

The Knickerbocker tunnel now being driven in Bellevue mountain, which in its course will cut the Crown Point vein, Clear Creek county, has encountered a breast of ore of the same character as that found in the Crown Point-Virginia property. The tunnel is now entering the productive gold belt of Clear Creek county, and may begin furnishing some excellent shipping ore almost any day if indications are to be credited.

## GEORGIA.

In sympathy with the general improvement in copper mining, there has been a marked improvement in all other lines of mining work. The northeastern part of Georgia has felt the effect of improvement. The Dahlonega Consolidated Gold Mining Co. at Dahlonega are preparing to test the southern gold mines as they should be tested, putting up large mills and chlorination works. I believe their proposition is to run 300 stamps eventually, and from the past history of the Finley Group they certainly have a success possible, if they carry out their plans with ample funds as at present proposed. It is the custom of western engineers to condemn all southern properties without knowing much about them, but a few years of deep mining will surely change this opinion. White county has also one of the most promising veins that can be found in any part of the country, and that is the Glen Comyn mines of Mr. C. C. Jones, a successful mining engineer in other lines. He has developed this property up to its present state with his own means, and can show a 500-foot shoot of ore that will average at least \$12, including the sulphuretes, with a width of 14 feet at least, and possibly up to 25 feet. He has a 15-stamp mill, which is paying more than the expenses and is preparing now to sink some shafts and develop his shoot of ore. It is said he has had offerings of large amounts of capital to complete his development.

Mr. Collins, at the Henby, is quietly developing that property, and working such ore as he takes out in the course of development with a 20-stamp mill, rather crude in construction but sufficient to do his testing work. The yield of ore is said to be very satisfactory and improving in depth.

## IDAHO.

A new mining company, known as the Springfield Gold and Copper Mining Company has recently been organized in Wallace for the purpose of operating prospects on Stevens' Peak. It is stocked up to a million shares and is in possession of three claims: the Mayflower, the Springfield and the Des Moines. On these \$5,000 worth of work has already been done. They are located on the same ledge as the Monitor mine, but much better. The average value of the ore, as shown by ten assays, is \$104.07 per ton in gold, silver and copper combined.

## KANSAS.

The number of tons of zinc ore billed and shipped from Galena was 1,880, or 3,760,000 pounds. Of this amount Central City and Cave Springs, Mo., produced 552,620, leav-

ing the output of zinc ore from the Galena-Empire district, 3,207,380 pounds, valued at \$48,110. The lead sales were 206,230 pounds, valued at \$4,950, and the total value of the Galena shipment was \$53,060.

McIndoe & Chew have secured a lease of three hundred and twenty acres of section 16, on the Kansas State line adjoining the Quapaw Reservation and near the old Peoria mines, and they will thoroughly prospect the ground with a steam drill, and may possibly drill it deep enough to see if the theory of experts who visited this section a few years ago is true that there is a big body of coal and oil below the surface.

## MICHIGAN.

There is great activity manifested at the Crystal Falls property, in Iron county, this winter to get the mine in shape for a banner output, and it is confidently expected that the record of 118,000 tons made last year will be beaten by a good round figure. Stocking was begun as soon as shipping was suspended and there is already quite a pile of ore on the dump.

An additional lift of 100 feet was added to the shaft, and new work now is confined to getting this new level in shape to produce ore.

There is nothing new to report from the Crystal Falls. The bailers have worked smoothly and without interruption the past week and the water now stands a few feet above the fifth level. A No. 12 Smith & Vaile pump was placed on the fourth level, so that the water is now being "bucked" by three bailers, averaging about a 1,000 gallons each, a No. 10 Cameron pump and the No. 12 Smith & Vaile pump. It is thought that the fifth level will be passed in a day or so.

About the same progress is being made in the unwatering of the Monitor as at the Western. The water now stands at the fifth level. There is a great deal of floating timber in the mine that seriously impedes progress, as it gets under the bailer occasionally and prevents it filling.

## MINNESOTA.

A copper strike has been made at the mouth of Knife River, about 13 miles from Duluth, on the north shore, that may result in mines that will rival those of the Michigan copper country. The strike is said to be one of the richest of the numerous copper strikes made in this vicinity in years.

E. P. Follett and Ebenezer Falconer are the men that made the strike. The North Shore Mining Company of Cleveland had Capt. Wade of Cleveland prospecting at the mouth of Knife River two years ago and spent \$25,000, it is said, looking for copper. Some strikes were made at that time.

Capt. Wade worked on stringers from the main vein of ore and struck several leads that would probably pay well. Nothing that he found, however, compares at all with the strike recently made.

Mr. Follett took options on the property last fall, and since that time has been prospecting. Recently while at work, Mr. Falconer, who is a mining engineer, made the strike already mentioned within 500 feet of the pits worked by Capt. Wade.—*Duluth News-Tribune.*

## MISSOURI.

Lead and zinc mining in Missouri are in the front ranks. At Cartersville, mining is carried on with the utmost vigor. The camp is more prosperous than it has been for years, and there is not an idle man in the camp who really wants to work. Old ground is being prospected that has lain idle for years, and a large amount of new ground is being opened tributary to the city. The turnin per week by leasers on the different lands will average about:—

	ZINC	LEAD.
Get There Mining Co. ....	130,500	26,030
Eleventh Hour Mining Co. ....	395,800	27,100
Catham Mining Co. ....	254,510	16,980
Total.....	780,810	90,110

At Webb City, the Narragansett Mining Company completed five drill holes last week on their 100 acre lease of the John C. Guinn land and struck ore in three of the five at 150 feet. They stopped the drill in ore at 165 feet in all three holes and have started two more holes. General Manager Hart is looking for another likely piece of ground to develop.

The turnin of the leasers of the Center Creek Mining Company per week shows an average of about 216,140 zinc and 15,430 lead.

If an impressive object lesson on the vast improvements in the methods of mining during the past three years were needed, it could not be given with greater force than by a visit to the great thriving camp of Oronogo. The impression is at once conveyed on entering any of the great mills that money and energy are behind everything connected with mining in this camp.—*Joplin Herald.*

## MONTANA.

During the past week one of the Brandon teams has been engaged in hauling ore from the tramway at the Baumgardth & Williams mine, on Indian Creek, near Sheriden, to the Smith mill, where, as soon as spring opens up, it will be treated. About 50 tons were hauled. The tramway at this time, which is about 500 feet long, shows how necessity is the mother of invention. It was made entirely at the mine, and by means of it the ore is safely and economically deposited to where it can be loaded on wagons. Two boats are used, traveling up and down on single track, the empty boat being drawn to the mine by the loaded one descending. Midway is an ingenious switch at which point the boats pass one another.

The strike in a cross-cut at the bottom of the shaft, in the King Solomon mine, near Clancy, in northern Jefferson County, improves in quantity and quality as work progresses and the drifts are being sent ahead. The ore when first encountered contained considerable quartz, closely resembling much of that shipped by the Livepool mine, but the quartz is gradually working out, as the drifts progress, leaving a cleaner product. It is not at present known how extensive the shoot may be, but it is safe to assume that it will be as large, if not larger, than were encountered in the upper levels. Perhaps no strike that has been made in the history of Clancy as a mining camp will equal this latest discovery in King Solomon mine. The ore body where encountered is said to be a strong body, two feet in width, and the cross-



cut is still in ore. The known rich character of the product of this mine guarantees a flow of wealth from it, if the ore shoot is extensive, that will easily eclipse that of any silver mine in this locality except perhaps the old Leg Tender.

## NEVADA.

### The Silver Peak Mines.

John Chiatovich and S. R. Wasson returned to Nevada last week from New York, where they were summoned as witnesses in the case of Blair against Hanchett. Mr. Wasson will remain in Carson until the Legislature adjourns. From Mr. Chiatovich it is learned that Blair secured a judgment against Hanchett for \$18,200. Part of this is for royalty due on ore extracted by Hanchett and part is for alleged damages to the mine during Hanchett's lease.

Mr. Chiatovich also says the mines are no longer in the market. About April 1st, Mr. Blair, grandson of John I. Blair, will go to Silver Peak and begin work on the mines. He will personally superintend the operations. It is to be hoped that Mr. Blair will work the mines on a large scale.—*Walker Lake Bulletin*

General Manager Luck has just arrived in the camp of Ione and his arrival there was never more welcome, as he informed the miners employed by the Nevada Co. that their wages had been raised from \$2.50 to \$3. The Nevada Company is the first to raise the wages on this coast since the cut of several years ago, and every one wishes this company success for its generosity to its employees.

## NEW MEXICO.

There is a little change at the Texas mines at Central. The drifts on the 500 foot level are showing up good bodies of ore, and the mill is making a good showing of high grade concentrates every day.

A. L. Shaw, a California mining operator, has bonded the St. Helena mine near Central City, from H. H. Whitehill and Henry Woods. The bond runs ninety days and the consideration is \$25,000. This mine shows a vein of gold ore, about one foot in width, which gives returns of from one ounce to an ounce and one half gold per ton.

## OREGON.

Messrs. J. G. and T. J. English of Dansville, Ohio, are erecting a 100-ton bromine-chlorine plant on the Golconda mine in north-eastern Oregon. The buildings for the plant are now completed and cover a space 170x300 feet, are constructed very substantially and are located so that rehandling of the ore will not be necessary. The whole plant is expected to be running by April 1st.

The Great Northern mine near Canyon City, Grant county, which was recently sold by Ike Guker to Salt Lake, Utah, parties, is being developed vigorously. Guker took out of this property \$25,000 before selling it, and numerous nuggets weighing from \$50 to \$200 have been found. One worth \$970 was found.

## SOUTH DAKOTA.

### Black Hills Notes.

The Spearfish cyanide plant is running again, after a temporary shut down, because of the ice interfering with the water power.

Ore is still being treated from the Metallic Streak, in Calamity Gulch, with good success.

The Horseshoe Company is making regular shipments to the Reduction Works at Pluma.

The Gilt Edge, in Strawberry Gulch, is shipping 80 tons daily to the reduction works at Rapid City.

The Chicago & Two-Bit Company, operating in the Two-Bit district, is steadily engaged in development work.

The Golden Crest, located in the Two Bit district, has closed down in accordance with orders from the directors of the company in the east.

## WASHINGTON.

Work on the Umatilla, situated near Kel-lar, on the south half, and under bond to Finch and Campbell, is progressing rapidly. When the claim was bonded in the latter part of November, a crosscut tunnel was started to tap the lead at 150 feet depth. This tunnel is now over 200 feet, and will tap the lead within the next 65 feet. Mr. Vanderford, the superintendent, is working two shifts of men, and is at present making over 3 feet in 24 hours.

## FOREIGN MINING NEWS

### BRITISH COLUMBIA.

The amount of ore shipped over the Kaslo-Slocan Railway from the Kootenay's during 1898, was 42,303,115 pounds. A detailed statement of the amount shipped by each mine will be found in our issue of Feb. 1, 1899.

This amount was distributed among the different smelters and ore buyers as follows:

	Pounds.
Pueblo .....	20,379,000
Everett .....	14,043,990
Pilot Bay .....	2,160,000
Kaslo .....	1,839,385
Aurora .....	1,755,650
Tacoma .....	1,139,270
Denver .....	758,000
Great Falls .....	120,160
Omaha .....	77,500
East Helena .....	30,160

Total pounds..... 42,303,115

The exports of ore cleared at the port of Kaslo for 1898 each month is as follows:

	Tons.	Value.
January .....	3,758	\$306,303
February .....	2,009	142,968
March .....	2,629	222,666
April .....	1,552	106,821
May .....	1,430	96,659
June .....	1,187	82,427
July .....	2,659	287,015
August .....	2,416	196,802
September .....	3,622	304,378
October .....	3,539	312,494
November .....	2,606	201,819
December .....	3,631	290,287
Total .....	32,038	\$2,550,669

Address all inquiries regarding the formation of a Southern California branch of the California State Miners' Association to the MINING AND METALLURGICAL JOURNAL. An industry producing annually nearly \$25,000,000 gold, should have an organization.

## Latest Mining Decisions.

Prepared by Andrews & Murdoch, Berrien Springs, Mich.

A miner who continued to work in a mine after he knew that large quantities of coal dust had accumulated there may recover for an injury caused by an explosion of the dust, where he neither knew nor ought to have known that the dust was liable to explode. *Knoxville Iron Co. vs. Pace*, 48 S. W. Rep. (Tenn.) 232.

Acts 1881, c. 170, requiring mine owners to employ overseers to examine the workings of mines generating explosive gases, and to see that they are "free from all danger," makes it incumbent on a mine owner to remove coal dust which is liable to create an explosion. *Knoxville Iron Co. vs. Pace*, 48 S. W. Rep. (Tenn.) 232.

The decisions of the courts of a state as to the construction and effect of mining leases therein established a rule of property which will be recognized and followed by the federal courts. *Foster et al vs. Elk Fork Oil and Gas Co. et al.*, 90 Fed. Rep. 178.

Laborers who work in a coal mine after a sale thereof under order of court by an assignee for the benefit of creditors, are not entitled to preference for their claims out of the proceeds of such sale in the hands of the assignee. *Haw et al. vs. Burch et al. (Otumwa Iron Works et al., Interveners)*, 77 N. W. Rep. (Iowa) 461.

Where, under a mistake of law, the lessor in a gas lease had paid an annual rental higher than that provided by the plain terms of the lease, there is not such a construction of the lease by the parties as will bind the court in constructing it. *Diamond Plate-Glass Co. et al. vs. Tennell*, 52 N. E. Rep. (Ind.) 168.

A gas lease of a tract 20 feet square out of 32 acres, which does not bind the company to drill a well and provides for a nominal rent, only, until a well is drilled, is not inequitable to the lessor where the lease also provides that, if any other well than the lessee's shall be drilled upon the 32 acres, the lessee shall be relieved from the payment of rent. *Diamond Plate-Glass Co. et al. vs. Tennell*, 52 N. E. Rep. (Ind.) 168.

### KANSAS LEAD AND ZINC.

[Continued from our issue of January 15, 1899.]

In the west-central part of the state, occupying a zone stretching across from western Jewell County to the Arkansas River, in Finney and Kearney Counties, a resinous colored calcite exists in peculiarly formed masses commonly called "septaria." Such masses are frequently found immediately at the surface of the ground, the soft shales surrounding them having been worn away. Not infrequently a level area of from 40 acres to 160 acres in extent has such rounded masses of calcite exposed on the surface, giving a general appearance of hay shocks in the distance. Ever since the country was settled, people have occasionally been more or less interested in knowing what these peculiar formations are. They have frequently been called zinc ore, probably on account of their strong similarity in color to some of the resin-colored zinc blends. Every year since the writer has been located at the University he has received many samples of this and associated material from widely separated localities along the line of outcroppings just given with requests to determine whether or not



the samples are zinc ore. The associated materials which have been sent in are variable and numerous in kind. Altogether perhaps twenty different samples have been examined, sometimes by the writer in person, sometimes by the chemical department of the University directly. It must be said that in every instance not a trace of zinc has been found in the specimens examined, although some of them were described by the sender as containing as high as forty per cent metallic zinc.

(To be Continued.)

## PROCESS OF MINTING COINS.

BY ALEXANDER E. OUTERBRIDGE.

[Continued from our issue of Feb. 1, 1899.]

*The Mechanical Processes.*—The coiner transfers the ingot to the rolling mill, and when they have been sufficiently laminated by successive rolling and annealing, the strips are passed through a machine called the "draw bench," for the purpose of reducing them to the exact thickness required for the coin. This operation is similar in principle to wire drawing and consists simply in squeezing the flat strips of metal between two stationary steel cylinders set to the desired gauge. The strips are now passed to the cutting press, which consists essentially of a round punch, the size of the "planchet," or blank, required for the coin, working up and down very rapidly into a hole on the steel bed plate.

The strips are passed by hand through the

press and the blanks fall into a box below. The unused portion of the strips or "clippings," is returned to the melter and refiner and remelted. The planchets are next taken to the "adjusting room," where may be seen a number of ladies seated at a long table, each one provided with a little balance and a file. Each lady is supplied with a pile of planchets, and she proceeds very deftly to weigh each one against a properly adjusted counter-weight. The planchets that are too light are thrown into a separate pile and returned to the melter and refiner, to be remelted with the clippings, while those that are too heavy are adjusted by filing on the edge. Some years ago a novel automatic adjusting machine, designed by Mr. Ludwig Seyss, of Vienna, was introduced for facilitating the work and diminishing the necessity of hand labor. It is an exceedingly beautiful and ingenious piece of mechanism, but is too complicated to admit of an intelligible description without the aid of sectional drawings. It not only weighs the blanks automatically, but also separates them into three kinds; those that are too heavy falling into one box, the light ones into another, and those of the right weight into a third. The machine will weigh and assort as many pieces an hour as five expert ladies can by hand, but when we consider that there are ten balances in the machine, engaged in weighing at the same time, and only five used by the ladies, they must be awarded the palm for expedition.

(To be Continued.)

## PERSONAL NEWS ITEMS

A. J. CLARK, accompanied by DAVID SWICKHEIMER, of Telluride, Colo., owners of the Japan mines at that place, are among the Colorado mining men visiting Southern California.

G. A. RICE has just arrived in Esmeralda county, Nevada, from New York, and is sampling a copper property on which he has a bond.

MR. EDWIN H. GARTHWAITTE, a graduate of the California State University, and of the College of Mines, Freiberg, Germany, who was called to South Africa by John Hays Hammond in 1895 as manager of the Nigel Deep Mines, has just been appointed by Cecil Rhodes Superintending Engineer for the South African Chartered Company at Bullawayo, Rhodesia.

F. A. HUNTINGTON, the mining and mining machinery man of San Francisco, was one of the callers at the JOURNAL office the other day.

D. C. BAKER of Deadwood, S. Dakota, left for the East last week upon mining business.

D. D. WHITNEY has returned from Twenty-nine Palms, where he has erected a cyanide plant at his mines.

WM. ARCHER and H. H. ARMSTEAD of New York arrived in Deadwood, S. Dakota, last week. They are interested in the Galena Mining and Smelting Co.

WILLIAM M. COURTIS, the mining engineer of Detroit, Michigan, has gone to Durango, Mexico, on a professional trip for prominent people of Detroit. He will visit Cripple Creek, Colorado, on his return.

H. A. SHIPMAN, who has been manager of the Delano Mill, at Boulder, Colo., for the Venture Corporation, of England, has returned to Baker City, Oregon.

## OBITUARY.

FRANCIS W. ROBINSON, a mining engineer of New Mexico, died at his former home, Chelmsford, Mass., January 24th, 1899, aged sixty-one years.



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## Acids.

Spot business is only fair, while for next year's delivery a few more contracts have been booked. Oxalic acid has been reduced by the syndicate to 64c.; thus the jobbers who have bought heavily at 64c. are now in a predicament.

Quotations are per 100 lb from New York and vicinity as follows: Acetic acid, commercial, No. 8, \$1.40@1.50; muriatic acid, 18°, \$1.10@1.75; 20°, \$1.20@1.87½; 22°, \$1.35@2.25; according to quantity and brand. Nitric acid 36°, \$3.50@4.75; 38°, \$3.75@4.62½; 40°, \$4@4.87½; 42°, \$4.62½@5.25. Oxalic acid, \$6.50@6.75. Mixed acids, according to mixture. Sulphuric acid, 66°, \$1.10 for drums and \$1.15@1.75 for carboys. Chamber acid 50°, in jobbing way, \$11.50@12 per ton f. o. b. factory. Blue vitriol \$3.50@3.62½ for extra grades and \$3.37½ for ordinary.

## BRIMSTONE.

The market has eased off on the arrival of 2,400 tons, and spot best unmixed seconds can doubtless be had at \$21 per ton, while futures are obtainable at \$19.50@20 per ton. Thirds are nominal at \$18.50@90. The shipments of brimstone from Sicily to the United States in November, were 7,300 tons.

## NITRATE OF SODA.

Buyers and sellers of nitrate of soda are still to far apart to come to any large sales, though about 5,000 bags were sold recently at \$1.52½ per 100 lbs. Sellers are quoting cp to \$1.55 for spot, and for futures extending through December, 1899, \$1.55 to \$1.57½ per 100 lbs.

## FINANCIAL NOTES.

## Average Prices of Metals

in New York per pound from January 1, 1898:

Month	Copper	Tin	Lead	Spelter
January	10.99	13.87	3.65	3.95
February	11.38	14.08	3.71	4.04
March	11.95	14.38	3.72	4.25
April	12.14	14.50	3.63	4.26
May	12.00	14.52	3.64	4.27
June	11.86	15.22	3.82	4.77
July	11.63	15.60	3.95	4.66
August	11.59	16.23	4.00	4.55
September	12.39	16.53	3.99	4.67
October	12.41	17.42	3.78	4.98
November	12.86	18.20	3.70	5.29
December				

## Average Monthly Prices of Silver.

In New York per ounce Troy, from January 1st, 1898, and for the years 1897 and 1896:

Month	1898	1897	1896
January	67.77	64.79	67.13
February	66.07	64.67	67.07
March	64.90	63.06	68.40
April	66.02	61.85	67.92
May	66.98	60.42	67.78
June	68.61	60.10	68.09
July	69.06	59.61	68.75
August	69.54	54.19	67.34
September	60.68	55.24	65.68
October	60.42	57.67	66.05
November	60.60	57.81	64.93
December		58.01	65.24
Year		59.79	67.75

The statement of the United States Treasury, on Thursday, Dec. 8th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Dec. 1.	Changes.
Gold	\$244,888,719	I. \$2,425,276
Silver	6,842,551	I. 109,110
Legal Tenders	14,973,531	I. 217,561
Treasury Notes, etc.	1,057,619	I. 354,179

Totals \$266,661,420 I. \$2,397,768  
Treasury deposits with national banks amounted to \$96,389,061, an increase of \$1,748,060 during this week.

## Gold and Silver Exports and Imports.

At all United States ports, October 1898, and year from January 1st, 1898 and 1897:

	OCTOBER, 1897	1898
Gold—		
Exports	\$313,311	\$1,279,926
Imports	11,773,483	16,227,352
Excess	I. \$1,142,172	I. 14,947,432
Silver—		
Exports	\$5,325,437	\$4,572,827
Imports	3,283,433	2,537,797
Excess	E. \$1,942,004	E. \$1,980,030
TEN MONTHS, 1897		1898
Gold—		
Exports	\$32,989,892	\$14,061,849
Imports	28,386,318	143,658,095
Excess	E. \$4,603,574	I. \$129,596,246
Silver—		
Exports	\$47,832,111	\$34,946,327
Imports	27,664,680	24,924,164
Excess	E. \$20,167,431	E. \$10,022,163

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

## \* WANTS \*

Advertisements of this class containing not more than five lines will be inserted for not exceeding three months in any year, free of charge, to all paid-up annual subscribers.

Other than above \$1.00 per month. Advertisements not accepted for less than one month.

WANTED POSITION OF Assayer with Mining Company. Have had experience in Milling and Cyanide works besides technical chemical training. References given. Refractory ores treated by Bromo-Cyanide method. Address, Tye JOURNAL Office.

EXPERIENCED Assayer and Cyanide operator desires engagement. The successful and economical treatment of slimy ore or tailings by cyanide a specialty. ADDRESS W. V. WATSON, Ely, White Pine Co., Nev.

MINING MAN of experience will develop Gold property of merit for ½ interest, or will bond whole mine and develop. Correspondence with owners only. Give full particulars. Will give satisfactory references. Address P. O. Box 887, Los Angeles, Cal.

## FOR SALE!

A COMPLETE 20-stamp mill and equipment including assay office outfit, see ad page 24. Address: BOX 234, LORDSBURG, N. M.

TREMAIN Two Stamp Steam Mill at Tucson, Arizona, 15-H. P. Boiler Pump and every thing complete, set up ready for work. In excellent condition, used less than six months. Address DREDGING MINING MACHINERY CO. Kansas City, Mo.

## FOR SALE AT A BARGAIN.

A 60-TON copper Smelting Plant, consisting of two 30 ton furnaces, one of which has new, seamless liner. Plant is complete in every detail. Also an 8-ton Silver-Lead Furnace, entirely new, never having been set up. All of the above located immediately adjacent to railroad. Enquire of GARDNER, WORTHEN & Goss, dealers in Mining and Mill Supplies, Tucson, A. T.

## ANTIMONY

## BISMUTH

PROSPECTORS having locations of this nature and wishing to sell at once for cash, will do well to address with full particulars, P. O. Box 2073, SAN FRANCISCO, CAL.

A VERY valuable, extensive Lead Mining Property in Southwest Virginia. Shafts sunk over 200 feet and actual work has demonstrated richness of veins and purity of ore. Address: GEORGE FRANK, Baltimore, Md.

## OPPORTUNITY.

GOLD, COPPER AND IRON MINING is profitable and respectable when you have the pay ores to mine. Because of owning more than we can properly manage, we propose to lease one or more valuable mines on equitable terms. Call or write VAN ANDA COPPER & GOLD COMPANY, Inns of Court Building, Vancouver, B. C. Van Anda City, Texada Island, B. C. 65 Wall Street, New York City.

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Riveted Boilers, Tanks, and Sheet Steel or Iron Work of every description

National Steel Ore Car Repairing of All kinds Promptly Attended to, PORTLAND, OREGON

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Tel. 505

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Estimates Furnished on all Classes of Mining Work

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## Bullock's Diamond Prospecting Core Drills

These are the only Machines which will give absolutely accurate records of borings. Fifteen styles and sizes. Operated by hand, horse, steam, air or electricity.

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Any style of mounting. Simple, compact, economical. Operated by air or steam

Hoisting and Haulage Machinery to fill any requirements.

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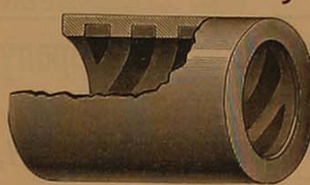
## Chas. P. Grimwood,

## Mining Engineer and Metallurgist

Laboratory, 214 Pine Street,

SAN FRANCISCO, CAL.

## Oilless Bearings,



For

Rope Tramways, HOISTING Engines, Tackle Blocks, Cam Shafts in STAMP MILLS. A Practical BEARING that RUNS WITHOUT OIL.

The Graphite Lubricating Company

BOUND BROOK, N. J.

## FOR SALE.

Four Fraser & Chalmers horizontal Boilers in batteries of two, can be seen set up Size of Boilers, 54"x16', 44 3/4" flues, half arch front, include all fittings complete and in first class order; will sell 2 or 4. Price each, \$300.

One 300-H. P. Fraser & Chalmers Corless Engine Cylinder, 24x48", sectional fly-wheel, 20"x37". Engine in fine condition. Price \$1,500.

Forty-stamp Mill, 850 lbs. rapid drop, together with timbers, bolts, rods, &c.; also building if wanted. Tuloc automatic ore feeders, screens, jigs (Heads), Frue Vanner tables, &c., fine condition and very cheap. Write or come and see us.

The S. S. Machinery Co., Denver, Colo.

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## Refiners and Assayers,

Bullion Buyers, Mining Experts, Constructing Engineers  
REFERENCE, CALIFORNIA BANK

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## MINING STOCK QUOTATIONS

BOSTON	
Aetna Con.	4 00
Allouez	5 12
Arctadian	39 38
Arnold	12 75
Ash Bed	2 25
Atlantic	23 50
Baltic	23 00
Bonanza	1 27
Boston & C. C.	42
Boston & Mont.	240 00
Breese	4 38
Butte & Boston	63 50
Calumet & Hecla	610 00
Catalpa	25 00
Centennial	26 00
Crescent	15
Dominion Coal	33 00
Dominion Pref.	116 50

ROSSLAND, BRITISH COLUMBIA	
Alecta	10
Big Three	15
Butte	01
Caledonia Con.	05
Colonna	23
Commander	12
Deer Park	19
Enterprise	18
Eureka Con.	05
Evening Star	05
Georgia	02
Gertrude	02
Good Hope	02
Grand Prize	03
Great Western	03
Hattie Brown	03
High Ore	02
Iron Mask	78
Iron Coll.	10
I. X. L.	10
Josie	30
Josie Mac	45
Jumbo	47

SAN FRANCISCO	
Alta Con.	12
Andes	13
Belcher	21
Best & Belcher	16
Bullion	10
Caledonia	13
Challenge	13
Chollar	10
Confidence	40
Con. Cal. & Va.	83

Crown Point	10
Deadwood	45
Gould & Curry	18
Hale & Norcross	85
Homestake	50 00
Iron Silver	66
Justice	08

COLORADO SPRINGS STOCKS	
Acacia	02
American Con.	01
Anaconda	27
Argonaut Junia	20
Banner	01
Bob Lee	00
Creede & C. C.	01
Dante	04
Des Moines	01
Elkton Con.	08
El Paso	00
Emma Almee	00
Fanny R.	21
Favorite	02
Findley	05
Flower of the West	00
Golden Fleece	22
Gold & Globe	01
Gold King	55
Gould	03
Hayden	04
Ingham Con.	04

SALT LAKE CITY	
Alice	75
Alliance	38
Anchor	80
Buckeye	06
Bullion Beck	5 25
Centennial	38 00
Chloride Point	1 38
Daisy	54
Dalton	01
Dalton & Lark	07
Daly	85
Daly West	4 05
Dexter	3 15
Eagle	08
Eagle & Blue Bell	1 87
Four Aces	48
Galea	60
Granite-Marion	80
Golden Eagle	09
Grand Central	8 00
Homestake	05
Horn Silver	1 15

NEW YORK	
Adams Con.	08
Alamo	05
Alice	80
American Gold	085
Anaconda Gold	50
Belcher	20
Best & Belcher	42
Breese	95
Brunswick	13
Caledonia	50
Cannon Ball	0035
Chollar	24
Chrysolite	13
Comstock Tunnel	04
Comstock Stocks	04
Comstock Script	04
Consolidated Imp	03
Con. Cal. & Va.	1 40
Copper Rock	00
Crown Point	15
Crescent	10
Cripple Creek Con.	10
Deadwood	40
Elkton Con.	85
Enterprise	35
Father of Smet	14
Garfield Con.	13
Gold Magnet	60
Golden Fleece	25
Gould & Curry	22
Hale & Norcross	1 70
Homestake	5 00
Horn Silver	1 15
Isabella	23
Iron Silver	75

DENVER STOCK REPORT	
Aetna	001
Anchor Leland	57
Anaconda	37
Arcadia	01
Argonaut Junia	20
Banner	—
Bob Lee	01
Elkton	88
El Paso G.	07
Enterprise	04
Fanny R.	21
Garfield Grouse	—
Geo. Washington	002
Golden Eagle	29
Gold Coin	98
Gilpin & C. C.	40
Gilpin Four	004
Golden Fleece	22
Isabella	23

Iron Clad	02
Jack Pot	03

Wheel of Fortune	002
Work	9 20

## MEXICO

Name of Company	State	Price
Alta Con.	Hidalgo	5
Amistad y Concordia	"	24
Angustias	Guanajuato	390
Arevalo y Anexas	Hidalgo	240
Asturiana y Anexas	Zacatecas	170
Barrados y Cabras	Durango	150
Bartolome de Medina	Hidalgo	100
Cabezon y An.	Zacatecas	30
Candelaria de Pinos	"	100
Capuaya	Durango	120
Carmen	Hidalgo	100
Castellana y San Ram	Tepec	25
Cerro Colorado	Chihuahua	10
Cinco Senores y An.	Guanajuato	490
Concepcion y Anexas	S. Luis Potosi	100
El Oro	Guanajuato	40
Esparanza y An.	Mexico	1,300
Guadalupe	Guanajuato	180
Huautla	Santa Ana	100
Luz de Borda	Michoacan	40
Luz de Maravillas	Hidalgo	100
Pabellon	"	150
Palma	Zacatecas	100
Paraisa de los Com.	"	5
Real del Monte	Hidalgo	900
Refugio y Va	Durango	8
Restauradora	Hidalgo	270
San Rafael y Anexas	"	12
S. Ped. Chalchihuites	"	825
do, Free Stock	"	400
San Rafael del Oro	Hidalgo	250
S. Maria de la Paz	S. Luis Potosi	60
Sirena	Durango	500
Soledad	Hidalgo	500
Sorpresas	"	250
Trinidad	Guanajuato	40
Tlaxiungo	"	27
Union	Hidalgo	250
Zomelahuacan (gold)	Vera Cruz	100
Zona Min. de Pozos	Guanajuato	15

Note—The above Mexican stocks are figured on the basis of Mexican silver

## ORE TESTING

Complete mill for testing ores on practical scale by all processes to determine the best process adapted to treating any ore submitted. Processes in use investigated to overcome unnecessary losses, etc.

## RICKETTS &amp; BANKS,

Metallurgists & Chemists

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Successor to San Francisco Tool Co.'s Machine & Mfg. Dept.

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## MINING AND PUMPING MACHINERY,

COMPRISING

Krogh 2-Stamp Triple-Discharge Quartz Mill, of Latest Improved pattern. Rock Breakers, Ore Feeders, Concentrators, Engines and Boilers, Hoisting Rigs to be operated by Horse, Steam Power or any other motor; Ore Cars and Ore Buckets, Cornish and Jack-head Pumps, Triple-Acting Pumps, Centrifugal Sand and Gravel Pumps, Wooden Tanks and Pumps for the Cyanide Process, Pipe and Gate Valves, Link Chain Elevators for elevating and conveying all kinds of material. Estimates as to cost of machinery and its erection furnished upon application. Write for Catalogue and Prices.

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Chas. Wier Manager, sells

## LUMBER

At Wholesale Prices

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AIR COMPRESSORS,  
ROCK DRILLS,  
Stone Channelers,  
The Pohle Air Lift Pump,  
Coal Cutters,

The Ingersoll-Sergeant Drill Co.,

HAVEMEYER BUILD'G.  
NEW YORK.

New Catalogue No. 32

New Catalogue No. 41

Pamphlet No. 100

Catalogue No. 72

Special.

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FRANK O. BECK, Sec'y and Treas.

THE PORTLAND GOLD MINING CO.,

(Stock Transfer Office, Colorado Springs.)

Mines at Victor, Colorado.

COLORADO SPRINGS, COLO., May 19, 1898.

The Ingersoll-Sergeant Drill Co.,

Gen'l Mgrs.—We bought two years ago one of the largest

size of the straight line type of Ingersoll-Sergeant Piston

Inlet Compressor.

This was found to be too small for our needs about a year

ago and we purchased of you a Duplex Corliss machine

16" x 18" x 42".

This was set in place in our shaft house in the Cripple Creek

District, 10,000 feet above the level of the sea, and has been

running continuously ever since, and at times over ten 3/4"

Helix drills. The steam cylinders were connected to an In-

dependent Jet Condenser, for which we are using the mine

water, and the resultant economy of operation is very

noticeable.

The operation of this Compressor is as near perfect as

that of any machine we have ever seen, and this type is well

worth the extra cost on account of the great permanent

economy in operation.

Our mine is equipped exclusively with your drills and we

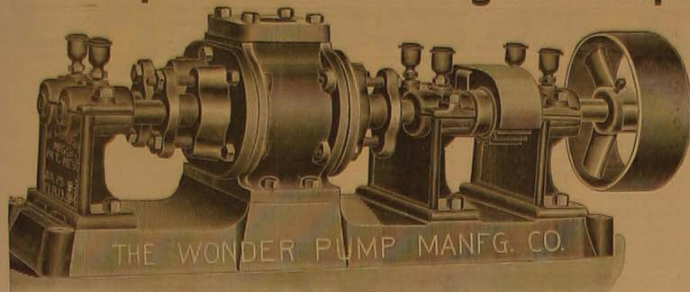
have only the highest words of praise to give them.

Yours very truly, The Portland Gold Mining Co.,

Jas. A. Burns, President



## The Improved WONDER Irrigation Pump



We also Build Vertical Style for Mining Purposes.  
Write for full particulars and Catalogue.

**Wonder Pump Mfg Co.,**

**KANSAS CITY,  
Missouri**

Established 1887

B. Sc. Members American Chemical Society

## WADE & WADE ASSAYERS

Chemical Analysis, Milling, Concentration and Cyanide Tests

Call and See our Stamp Mill and Frue Vanner 115 1/2 N. MAIN ST., LOS ANGELES, CAL.

See those wires--how they interlock? Note the smooth surface also.



No Displacement of Wires in any event. \* Gives three times the service of other cables and adds correspondingly to the life of the rolling stock.

— THE PATENT —

## LOCKED-COIL TRACK TABLE

IS USED ONLY ON THE PATENT

### Bleichert Wire Rope Tramway

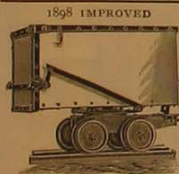
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— ENGINEERS AND CONTRACTORS —

And Sole Licensees in North America for the Bleichert System. Also, Wire Rope Equipments for Surface and Underground Haulage, Transmission of Power, etc. Illustrated book upon application

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## The Truax Patent Improved Automatic Ore Cars

MADE BY

**THE TRUAX MFG. CO.**  
DENVER, COLORADO SAN FRANCISCO, CAL.

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114 First St.

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Jan. 8, 1892. Aug. 27, 1895.  
July 19, 1898.  
In Canada, June 21, 1898

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Manufactured by the Western Chemical Co., Denver, Col. For Chlorination. Refining and other processes. Also Muriatic and Nitric Acids, Blue Vitriol, Copperas Refined Sulphate of Soda, Etc.

## THOMAS PRICE & SON

Analytical Metallurgical and Physical Testing Laboratory

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## Randsburg Gold Fields

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Leave Los Angeles, 10:20 a. m.  
Leave San Bernardino 12:10 p. m.  
Arrive Barstow 3:15 p. m.  
Leave Barstow 3:55 p. m.  
Arrive Kramer, 5:05 p. m.  
Arrive St. Rimo, 8:15 p. m.  
Arrive Johannesburg 8:50 p. m.

Returning Trains Leave  
Johannesburg 8:00 p. m.  
Arrive San Bernardino 5:35 a. m.  
Arrive Los Angeles, 8:30 a. m.

A through passenger coach is run between Barstow and Johannesburg.

Through tickets and particulars of any Santa Fe Route Agent.

Stage leaves Johannesburg for Ballarat on Sundays and Thursdays at 7 a. m.; returning arrives at Johannesburg on Tuesdays and Fridays at 8 p. m.

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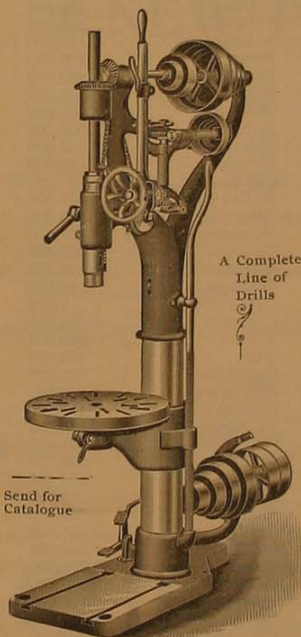
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Gold .....	\$ .50	Copper .....	\$1.00
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Samples by mail receive prompt attention.  
Highest price paid for Bullion.

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A 20 Stamp Mill, 4 Ore Feeders, 1 Blake Crusher, 10 Pans, 5 Settlers, 4 Frue Vanners, Howell-White Furnace, Revolving Ore Dryer, 125 h. p. Carliss Engine, 1 set Double Boilers (120 h. p.), 2 Hoisting Plants and Boilers, 1 Deep Well-Boring outfit and Assay outfit complete, located 8 miles from Railroad. Will be sold very low.

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Of Power Transmission, Appliances, Patent cold rolled steel shafting, Cast Iron Pulleys, Couplings, Ball and Socket self-oiling hangers, Floor Stands, Wall Frames, Belt Tighteners, Wire Rope Sheaves, Band and Fly Wheels, Rope Transmission. Also valuable notes on engineering.

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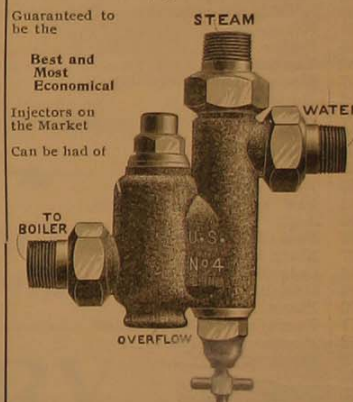
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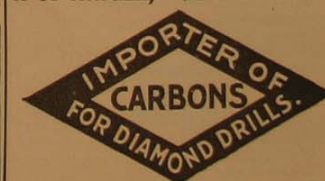
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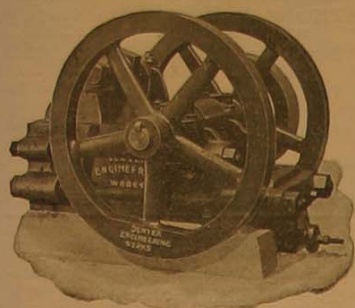
	NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Minerals Produced
1	Aetna Cons.	California	100,000	\$ 500,000	\$ 5	\$ 10	Oct 1898	\$ 150,000	Q.
2	Alaska, Treadwell	Alaska	200,000	5,000,000	25	37 1/2	July 1898	3,550,000	G.
3	Alaska Mexican	Alaska	200,000	1,000,000	5	10	July 1898	299,031	G.
4	Alice	Montana	400,000	10,000,000	25	05	April 1898	1,075,000	G, S, L.
5	Anaconda	Montana	1,200,000	30,000,000	25	1 25	Nov 1898	8,250,000	C.
6	Anchoria Leland	Colorado	600,000	600,000	1	01	Nov 1898	168,000	G.
7	American Gold	Colorado	300,000	3,000,000	10	09	Oct 1898	362,000	G, S, L.
8	Associated	Colorado	1,250,000	1,250,000	1	01	Nov 1898	50,000	G.
9	Atlantic	Michigan	40,000	1,000,000	25	1 00	Feb 1898	780,000	S.
10	Aurora	Michigan	100,000	2,500,000	25	50	May 1898	750,000	L.
11	Bald Butte	Montana	250,000	250,000	1	03	Oct 1898	627,148	G, C, S.
12	Big Six	Colorado	500,000	500,000	1	00 1/2	May 1898	15,000	G, S.
13	Boston & Montana	Montana	150,000	3,750,000	25	5 00	Nov 189	9,125,000	G, C, S.
14	Breece	Colorado	200,000	5,000,000	25	05	Dec 1898	30,000	L.
15	Bullion Beck and Champion	Utah	100,000	1,000,000	10	10	Dec 1898	2,535,000	G, S.
16	Bunker Hill and Sullivan	Idaho	300,000	3,000,000	10	07	Nov 1898	579,000	S. L.
17	Cariboo	British Col.	800,000	800,000	1	02	Aug 1898	236,965	G.
18	Calumet & Hecla	Michigan	10,000	2,500,000	25	10 00	Sept 1898	54,860,000	C.
19	Centennial Eureka	Utah	30,000	1,500,000	50	50	Dec 1898	2,250,000	S. L.
20	Central Lead	Missouri	10,000	1,000,000	100	50	Nov 1898	77,000	L.
21	Champion	California	34,000	340,000	10	25	April 1898	296,200	G.
22	Charleston	S. Carolina	10,000	1,000,000	100	1 50	Sept 1898	165,000	.....
23	Chloride Point	Utah	500,000	500,000	1	01	Dec 1897	5,000	G, S.
24	Colorado Smelting	Montana	100,000	1,000,000	10	50	July 1898	1,595,000	G, S, C.
25	Crowned King	Arizona	600,000	6,000,000	10	02	Oct 1898	208,000	G, S, L.
26	Deadwood Terra	S. Dakota	200,000	5,000,000	25	05	May 1898	1,350,000	G.
27	De Lamar	Idaho	400,000	2,000,000	5	29	May 1898	2,451,600	S. L.
28	Dutch	California	150,000	1,500,000	10	04 1/2	Feb 1898	39,000	G.
29	Elkton Consolidated	Colorado	1,250,000	1,250,000	1	01 1/2	Oct 1898	636,961	G, S.
30	El Paso	Colorado	650,000	650,000	1	01	Jan 1898	12,093	G, S.
31	Empire State	Idaho	75,000	750,000	10	10	Nov 1898	35,000	.....
32	Enterprise	Colorado	500,000	500,000	1	05	Sept 1898	900,000	S, L.
33	Fern	British Col.	200,000	200,000	1	05	Jan 1898	110,000	.....
34	Geyser-Marion	Utah	300,000	1,500,000	5	02	Sept 1898	96,000	G.
35	Gold Coin of Victor	Colorado	1,000,000	1,000,000	1	01	Oct 1898	120,000	G.
36	Golden Cycle	Colorado	200,000	1,000,000	5	02 1/2	Oct 1898	155,000	.....
37	Gold Coin	Colorado	200,000	1,000,000	5	05	Nov 1897	160,000	G, S.
38	Golden Reward	S. Dakota	1,000,000	1,000,000	15	15	Feb 1898	155,000	G.
39	Grand Central	Utah	250,000	250,000	1	12 1/2	Dec 1898	218,750	G, S, C, L.
40	Halls Mines Ltd.	British Col.	250,000	1,250,000	5	25	May 1898	160,000	.....
41	Highland	S. Dakota	100,000	10,000,000	100	20	Nov 1898	3,764,718	G.
42	Holy Terror	S. Dakota	300,000	300,000	1	03	Sept 1898	117,000	G.
43	Homestake	S. Dakota	125,000	12,500,000	100	50	Nov 1898	7,118,750	G.
44	Hope	Montana	100,000	1,000,000	10	10	Mar 1893	762,252	S.
45	Horn Silver	Utah	400,000	10,000,000	25	05	Sept 1898	5,210,000	S, L.
46	Idaho	British Col.	500,000	500,000	1	05	May 1898	264,000	.....
47	Iowa	Colorado	1,000,000	1,000,000	1	00 1/2	June 1898	90,000	G.
48	Iron Mountain	Montana	500,000	5,000,000	10	02	Apr 1898	507,500	S.
49	Isabella	Colorado	2,250,000	2,250,000	1	00 1/2	June 1897	270,000	G.
50	Kearsarge	Michigan	40,000	1,000,000	25	10	Aug 1897	160,000	C.
51	Kennedy	California	100,000	10,000,000	100	48	Aug 1898	1,790,000	S, L.
52	Le Roi	British Col.	500,000	2,500,000	5	10	Apr 1898	775,000	G.
53	Lillie	Colorado	1,000,000	1,000,000	1	01	Oct 1898	146,110	G.
54	Minnesota	Minnesota	185,000	18,500,000	100	1 50	Oct 1898	4,735,000	L.
55	Modoc	Colorado	500,000	500,000	1	01	Dec 1898	110,000	G.
56	Montana Ltd	Montana	660,000	3,300,000	5	05 1/2	May 1898	2,997,557	G, S.
57	Montana Ore Purchasing	Montana	40,000	1,000,000	25	1 00	Oct 1898	800,000	.....
58	Morning Star	California	2,400	240,000	100	5 00	June 1898	666,600	G.
59	Mt. Rosa	Colorado	1,000,000	1,000,000	1	02	Jan 1898	60,000	G.
60	Mercur	Utah	200,000	5,000,000	25	12 1/2	Nov 1898	1,218,000	G.
61	Mammoth	Utah	400,000	10,000,000	25	05	Oct 1898	1,330,000	G, S, C, L.
62	Moon Anchor Gold	Colorado	600,000	600,000	1	07 1/2	Nov 1898	281,000	G.
63	Mountain Copper	California	250,000	6,250,000	25	62 1/2	Sept 1898	93,750	C.
64	New York & Hon. Rosario	Central A.	150,000	1,500,000	10	10	Oct 1898	945,000	S, G.
65	Napa	California	100,000	700,000	7	20	Oct 1898	950,000	Q.
66	New Idria Quicksilver	California	100,000	500,000	5	20	Sept 1898	80,000	Q.
67	North Star	California	200,000	2,000,000	10	25	Nov 1898	500,000	G.
68	Ontario	Utah	150,000	15,000,000	100	75	Dec 1897	13,542,500	S, L.
69	Osceola	Michigan	50,000	1,250,000	25	2 00	Dec 1898	2,552,500	C.
70	Parrot	Montana	230,000	2,300,000	10	30	Oct 1898	2,069,898	C.
71	Pennsylvania Consolidated	California	51,500	5,150,000	10	05	Oct 1898	46,500	.....
72	Pioneer	California	100,000	1,000,000	10	12 1/2	Dec 1898	50,000	G.
73	Portland	Colorado	3,000,000	3,000,000	1	02	Nov 1898	2,250,080	G, S.
74	Princess	Colorado	1,000,000	1,000,000	1	00 1/2	Feb 1897	47,000	G.
75	Quincy	Idaho	100,000	2,500,000	25	3 50	Aug 1898	10,120,000	C.
76	Rambler-Cariboo	British Col.	1,000,000	1,000,000	1	02	April 1897	40,000	.....
77	Raven	Colorado	1,500,000	1,500,000	1	01	March 1898	20,000	G.
78	Reco	British Col.	1,000,000	1,000,000	1	10	Jan 1898	287,500	S, L.
79	Republic	Washington	1,000,000	1,000,000	1	03	Dec 1898	90,000	G.
80	Sacramento	Utah	1,000,000	5,000,000	5	00 1/2	Nov 1898	67,000	G.
81	Santa Rosalia	California	100,000	100,000	1	10	Feb 1898	125,000	G, S.
82	Small Hopes Consolidated	Colorado	250,000	5,000,000	20	10	June 1898	3,300,000	S.
83	South Swansea	Utah	150,000	150,000	1	05	Oct 1898	125,000	S, L.
84	Standard	California	200,000	20,000,000	100	10	Aug 1898	5,674,940	G, S.
85	St. Joseph	Missouri	30,000	3,000,000	10	1 50	Sept 1898	2,747,000	L.
86	Silver King	Utah	150,000	8,000,000	20	25	Dec 1898	1,800,000	S, L, G.
87	Slocan Star	British Col.	2,000,000	1,000,000	0.50	05	Mar 1897	350,000	.....
88	Smuggler	Colorado	1,000,000	1,000,000	1	01	Oct 1898	1,075,000	S, L, Z.
89	Swansea	Utah	100,000	500,000	5	05	Dec 1898	136,500	S, L.
90	Tamarack	Michigan	60,000	1,500,000	15	3 00	June 1898	5,331,000	C.
91	Victor	Colorado	200,000	1,000,000	5	50	Dec 1898	1,155,000	G.
92	Vindicator	Colorado	1,500,000	1,500,000	1	05	Oct 1898	180,500	G.
93	Western Mine Enterprise	Montana	500,000	5,000,000	1	20	Jan 1898	48,680	.....
94	War Eagle	British Col.	2,000,000	1,000,000	1	01 1/2	Oct 1898	239,000	.....
95	Wolverine	Michigan	80,000	2,500,000	25	1 00	Oct 1898	60,000	C.
96	White Water	British Col.	125,000	1,250,000	5	32	April 1898	194,000	.....
97	Yellow Aster	California	100,000	1,000,000	10	10	Oct 1898	148,789	G.

R, Silver. G, Gold. L, Lead. C, Copper. Q, Quicksilver. I, Iron. Z, Zinc.

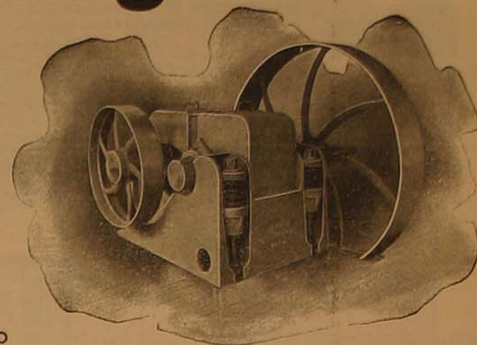
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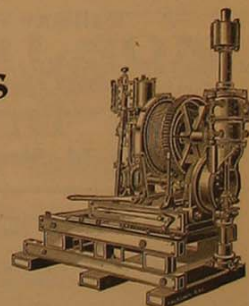
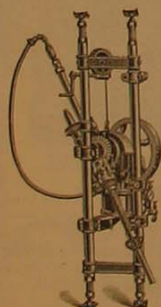
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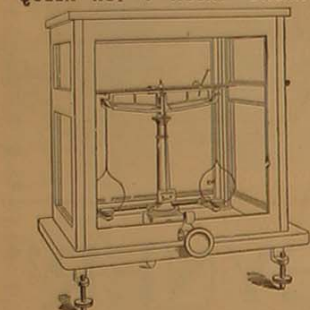
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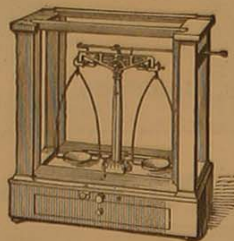
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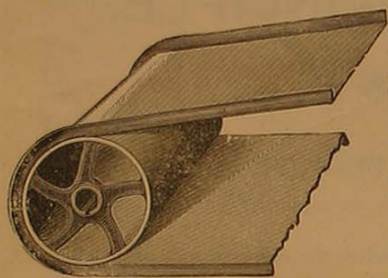


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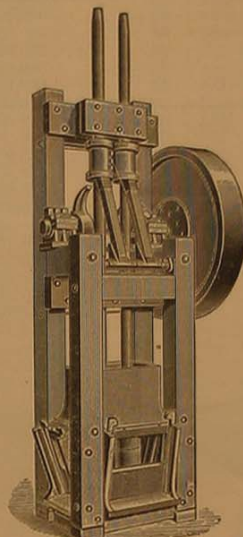
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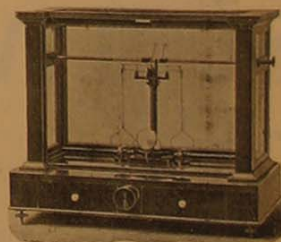
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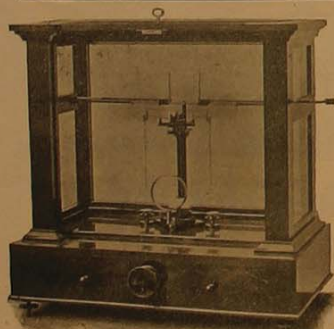
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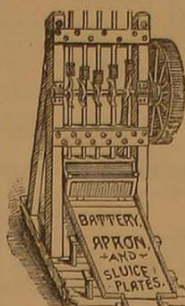
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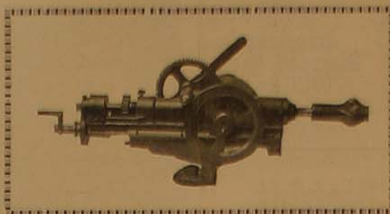
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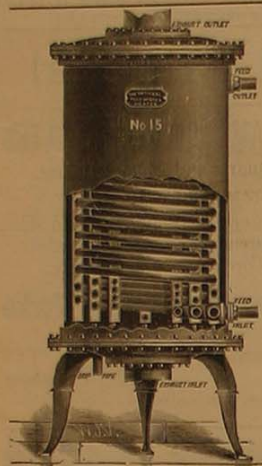
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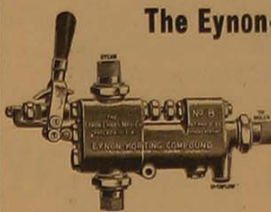
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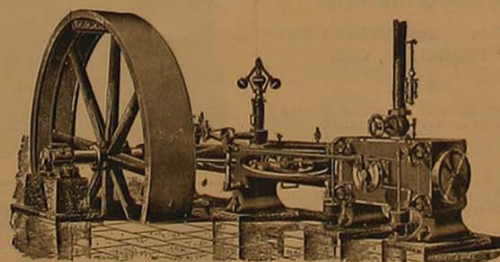
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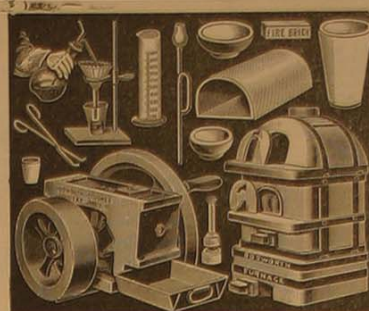
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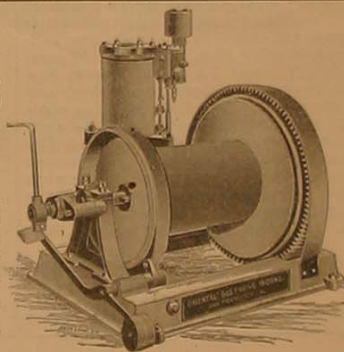
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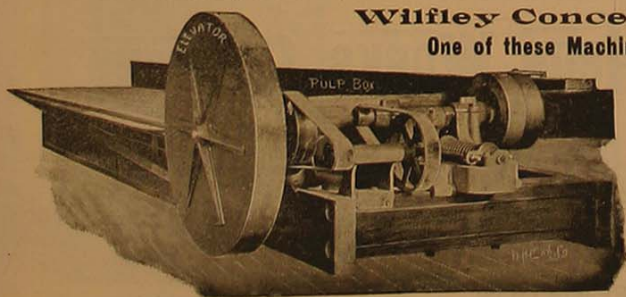
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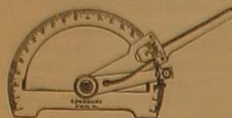
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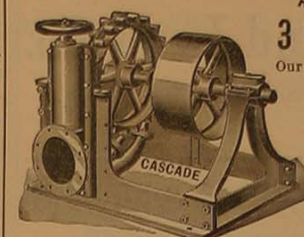
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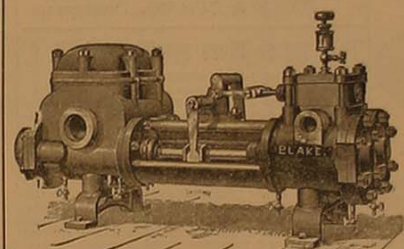
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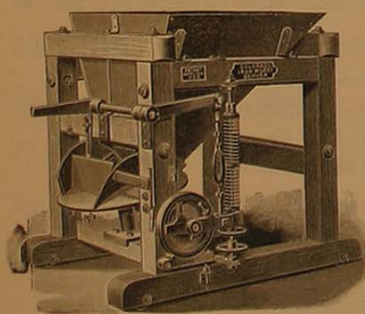
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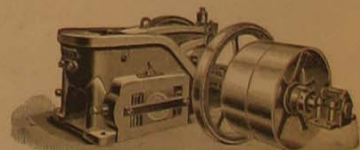
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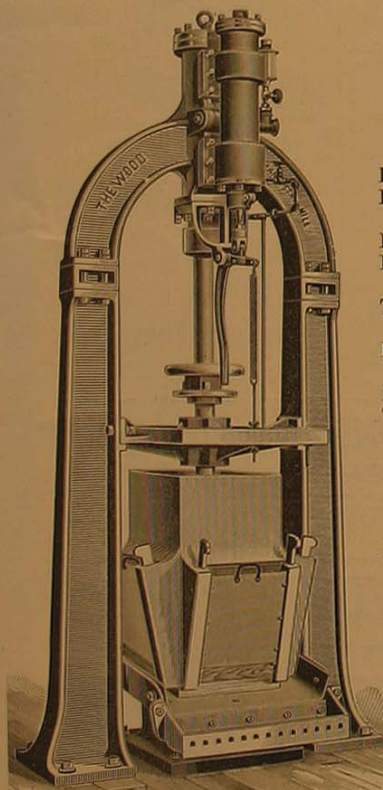
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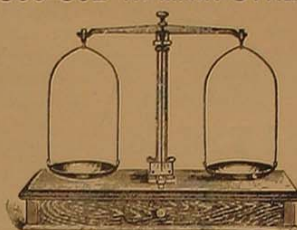
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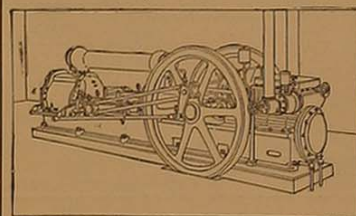


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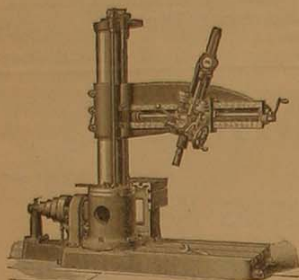
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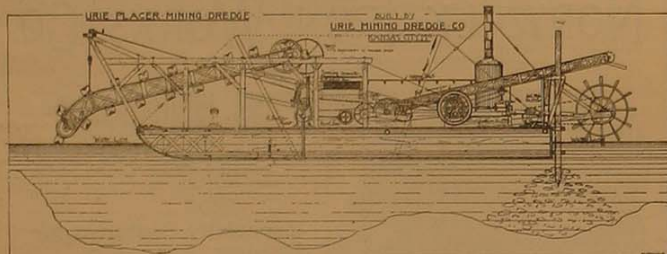
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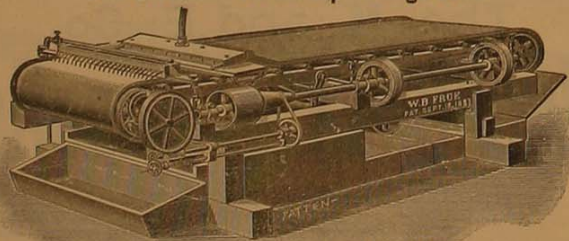
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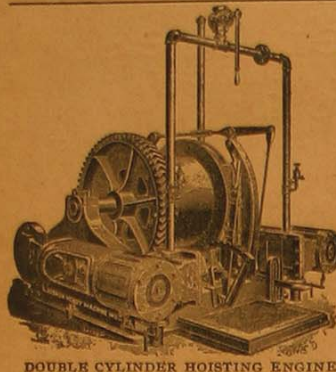
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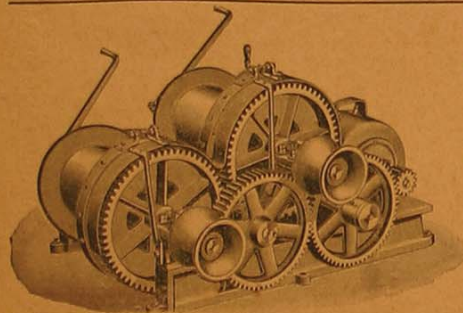
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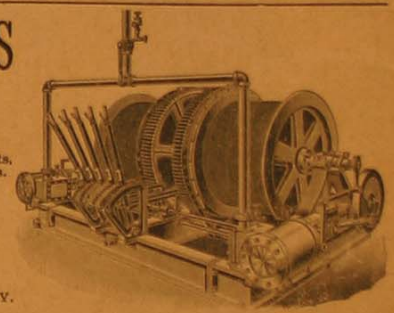
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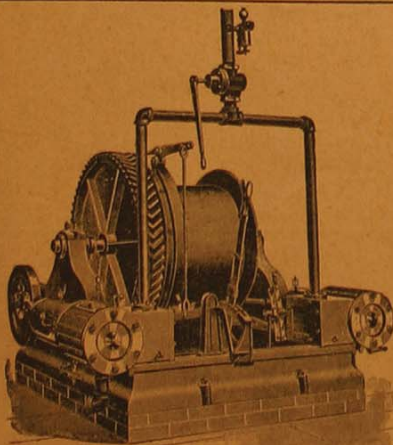
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